BOOKLET 2

DIVISION OF SPECIAL LIBRARIES

SECTION OF ADMINISTRATIVE LIBRARIES

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Hans H. van der Neut, Library and Documentation Department, Ministry of Education and Science, Zoetermeer, Netherlands

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Jean Michel, Centre Pédagogique de Documentation et de Communication, Ecole Nationale des Ponts et Chaussées, Paris, France

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Ann Irving, Department of Library and Information Studies, Loughborough Univeristy, Loughborough, UK

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Lena Sewall, Hospital Library, Karlstad Central Hospital, Karlstad, Sweden

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Solveig Thorsteinsdottír, Landspitalinn Medical Library, Reykjavik, Iceland

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Elisabeth Buntz, Rikshospitalet Medical Library and Information Centre, Oslo, Norway

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Rolf Dahlø, National Office for Research and Special libraries, Oslo, Norway

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Ivar A.L. Hoel, Royal School of Librarianship, Copenhagen, Denmark

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Wijnand Goossens and Jacobus van de Watering, Royal Library, The Hague, Netherlands

Principles of Government Librarianship

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Abstract
Government libraries are special libraries in a political setting, but they are also just corporate libraries. The paper focuses on ministry libraries as an example. The reasons for the existence of a ministry library are discussed, and also the different tasks and functions, also outside the ministry. Some problems are discussed, e.g.: grey literature, censorship, split-ups, the use of computers. Recommendations for a strong position of the library are given.

Introduction

Government libraries are, on the one hand, very special libraries because they work in a political setting. Their main principal is a minister or a city government etc., but he/she or it is always in the uncertain circumstances which are inherent in politics. On the other hand I dare to say, due to my experience in three ministry libraries, that most points in this paper are also relevant for other corporate libraries, even in commercial business firms.

For more literature on corporate librarianship I draw your attention to an article in the journal "Special Libraries" by Herbert S. White (1).

This paper focuses on ministry libraries as an example.

Ministry libraries must be aware that, for the ministry, their budget is part of the overhead costs: the effect of their work is only indirect. So sometimes they must even defend their mere existence. There are many good reasons for that existence, to be found mainly in the skills of the library's personnel.

Tasks and functions

There are also many actual tasks for a ministry library, but beware of exaggeration. The library has always shortage of staff and money, so it cannot pretend to be able to give all the service which could be useful. And besides that: many library users like to look and search for themselves.

Generally the main task of a ministry library is to support the policy makers in the ministry. A former Dutch minister of Environment introduced the model of the "policy life cycle" (2) with four phases: recognition, policy formulation, solution and control. The ministry library has especially a task in the first two phases.

Part of the business can also be: a service to people and organisations outside the ministry. The reasons for this can be manifold:

* an instruction to do this because of:
 – the relations with the "field";
 – an information service for the public;
 – the ministry's public relations.
* but it may also be in the interest of the library itself, regarding:
 – an allocation of tasks;

- the principle of reciprocity;
- a chance for earning money.

In the Netherlands we distinct four functions of a ministry library: the internal "corporate function" and three external ones: the "field function", the "complementary function" and the "national function". (3)

Some problems
* grey literature: difficult material, but it gives a chance to present the library with a good profile.
* the dividing line between public and confidential material: even unpublished documents can be public.
* censorship and the value of illegal publications: value for the library and for the minister.
* the changeableness of the political management, and the value of continuity.
* the splitting up of a ministry: should the library collection be split up, too?
* the closing down and the joining together of ministries: many practical problems.
* the use of computers and CD-ROMs.

Recommendations for a strong position
Arrange for the membership of some networks of people and institutions:
- with other government libraries in the country;
- in the "field" of the ministry;
- with universities and research institutions;
- international.

Take good care of regular contact with the policy departments and the central management department (if there is any) of the ministry. This can give good feedback, in different ways.

Some of the library's patrons are more important for the library than other ones (e.g. because of their position and influence). It can be a good idea to provide them with a special service or extra material, but in any case this must contain really relevant information.

Take good care to have some visible and tangible products: not only the service of an information desk, but also lists or reviews on actual topics.

Try to integrate the library's information with related types of information: documentation, statistical data, legal information, etc.

Have a good relationship with the department which is responsible for the public relations, the spokesmanship and the ministry's publications. Partly they work in the same field as the library does and their attitude to actuality and publicity can be a great help to the library.

And above all: deliver the best service you can, each day again.

The future
What the future has in reserve for any library, depends very much on what is possible in its organisation and its country. That is a matter of technical, financial and managerial possibilities. Anyhow, the information explosion will not come to an end very soon, and for that reason libraries and documentation centres will keep their function in society. The more information there is, the more professional help is needed with selection and retrieval. Indeed, it is still true what Naisbitt said, years ago (4): "We are drowning in information, but starving for knowledge."

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Strategic Planning as an Instrument of improving Library Quality

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Abstract

Strategic planning is becoming more important with increasing financial and other pressures on libraries. By constructing a plan (which will normally cover five years) a library can take some control of its future. No generally applicable model can be laid down, but some features are common to all or most plans. Staff at all levels should be involved in the preparation of a plan. The effect on them of seeing the library as a whole and helping to shape its future can be considerable. Strategic planning can be a catalytic and creative force.

Purpose

Strategic planning has become quite common in libraries in several countries in recent years, following its use in other organizations in both the public and private sectors. It might be regarded as simply another fashion in management, soon to go the way of other fashions: or as just a new name for a process that libraries and other bodies do anyway. Certainly there are corporate plans, business plans, development plans, forward plans, five-year plans, and various other names that may express more or less the same thing – or they may not.

A strategic plan implies a systematic process based on a real *strategy* for the future. It establishes coherent aims realizable within a given period of time, usually five years in public sector bodies, in the context of a set of clear objectives. It thus sets out both a destination and a map that the organization should follow in reaching it. Why is this process desirable now if libraries have done without it for generations?

In the past libraries were able to live from year to year, usually with annual increases in their budgets, without having to look at priorities too closely or even having to justify their budgets in any but general terms. Forward planning, where it existed, consisted largely of requests for more and more money to do more and more things: in effect, a plan was a wish list. This is no longer possible for the majority of libraries, which have to contend with smaller funds in real terms, with a greater range of competing demands and opportunities, and above all with ever increasing pressure from their parent bodies for accountability, value for money and precise justification of all resources. Libraries have to make sure that they know where they are going, that they are making optimal use of their present resources of stock, staff, buildings and equipment, and that they have a clear sense of priorities, both for what they would cut from their present activities if they had to and for what they propose to do in the future.

Library plans need of course to relate to any plans that their parent bodies may have constructed or be in the process of constructing. It is tempting to wait until such plans are ready before preparing a library plan, but this is usually a mistake. Either the organization's plan does not mention the library, in which case time has been lost waiting; or it mentions the library in ways that show misunderstanding, in which case it may be difficult to change it; or, worst of all, it includes a plan for the library which shows good understanding but which sets out a direction and path other than that which the library wants to follow. It is far better in my view for the library to prepare its own plan, in the light of known institutional object-

ives, either parallel with or in advance of the institutional plan; either way, it can exercise a strong influence on the institutional plan. Most important of all, in constructing a strategic plan the library can take some control over its own future; it cannot blame the parent body for pushing it in wrong directions if it has not established for itself the right ones.

Audience

The first and obvious audience for the strategic plan is the parent body, for the reasons stated; the library needs to convince it that it has a sense of direction and is well equipped in management terms to follow it. However, an equally important audience is the library's own staff, who can benefit greatly by seeing the library's proposed future set out; the involvment of staff in the preparation of the plan and the follow up to it is dealt with later. A further audience is the wider public; this is particularly important in the case of a public library, serving as it does a local community, or a national library, which serves the whole nation, including other libraries.

Nature

As stated above, the strategic plan will generally cover five years. A commercial company will not usually wish, or be able, to look that far ahead, because conditions, markets and competitors can change quite rapidly. In the public sector there is less change of this kind, though change has become much more rapid in the last decade or two, and five years is by no means too long a period. Indeed, it is often desirable in the case of national and major academic libraries to start by attempting a longer perspective, say over ten years. The plan can then be formed in the consciousness of this longer term vision.

As also stated, the plan must not be a wish list. Its precise form will vary with circumstances, and a generally applicable model cannot be laid down, but some features will be common to all or most plans.

After a foreword explaining the purpose and intended audience of the plan, it will typically begin with a general statement of the library's aims and objectives, commonly called a mission statement. It may then have a section on the background – the institutional bakground, and external factors such as the growth of published material and developments in electronic publishing.

The plan proper will be divided into chapters dealing with different parts or activities of the library. How it is structured depends on how the library sees itself or wishes to be seen. A library with an important archival function will place emphasis on collections, one with a more prominent service function, such as a public library, will emphasize services. The obvious division for national and academic libraries is into collections, services, equipment, staff and so on; but there are a number of ways in which each chapter can be arranged, and the library may decide to organize the whole plan in a more adventurous way, for example by type of user or service, subordinating collections in either case. A possible outline for an academic library is given as an appendix.

Each chapter should include a brief statement of the present position, its strengths and weaknesses; a list of actions needed to deal with the weaknesses, with an indication of priorities and also an estimate of costs and time-scale required to meet them; and a statement of proposed new services and activities, again with costs and timing.

As well as chapters on various parts of the library's service, the plan will normally have chapters on aspects that cut across the operations but that are worthy of special attention, such as automation and equipment.

It is important that the plan should be as specific as possible about the objectives and how they are to be reached. Since it is assumed that resources are limited or have to be argued

for in quantifiable terms, activities should, as noted above, have costs and also performance indicators attached to them. For exemple, if a larger acquisition fund, or a different disposition thereof, is proposed, the cost-effectiveness of the present and proposed allocation should be established in general terms; and if it is intended to extend services or create new ones the plan should state how their success is to be assessed.

Unless the library is unusually well managed, it will not be able within the time of the plan's preparation to be very precise about costs and performance indicators; all that may be possible is to set them down in general terms, and then to undertake to go into more detail later. Indeed, it might well be one of the planned actions to establish costs and performance measures in the first year or so of the period.

Each chapter should start with its own statement of objectives, and then state how they are to be met over the five years. This will mean that a programme has to be established, not year by year but with some indication of time-scale. For example, it may be stated that one or more uncatalogued special collections will be completed within the first two years, and some remaining ones in the rest of the period. The programme will necessarily become vaguer longer into the period.

The need for clear priorities has already been mentioned. It cannot be stressed too strongly that no library, or part of a library, can do all that it would like to, and choices have to be made.

Every library, unless it is a very unusual one, has messes in varying numbers and of varying scale and seriousness. The plan offers an opportunity to look at these in a total context. It may be concluded that a particular mess would take so long to clear up, and that its importance is now so little, that it is best abandoned altogether, even if it means (for example) the disposal of a special collection. There is a danger that the whole plan will consist of a programme to deal with messes; the impression this makes on the minds of readers can only be negative (the institution must wonder why the library is in such a state), and it is important that mess management and disposal are balanced by positive proposals to improve services. The plan must be forwardlooking, not backward-looking.

Indeed, the *tone* of the plan is almost as important as its contents. The library must not give the impression that it exists only to suit itself or its staff. "Customer concern" is currently a popular slogan, but it is not a fad; no library except one that is primarily a museum is ultimately of use unless it serves people, and that must be one of the messages that the plan conveys.

The style of the plan is also important. Wording such as "the library wishes to..." or "the library hopes to..." is not appropriate. The plan must be a statement of real intentions. "The library will..." is best if it is certain that the action can be carried out; a less positive wording, which may be necessary in some cases, is "the library proposes to...". There is no reason why, when the library wishes to explore a new service or the use of new methods for existing activities, the plan should not say "The library will examine such-and-such with a view to..." or "The market for so-and-so will be explored". The first strategic plan may contain quite a few such statements.

If a strategic plan is to make an impact, or even be read at all, it should be concise. A summary at the beginning is highly desirable, but it should not be used as an excuse for inordinate length of the main document. In a library of any size, 20 pages is probably the minimum possible, but anything over 40 pages is too long.

A strategic plan will normally be revised within the first three years; in effect, it will be a rolling plan. This is necessary because circumstances – not merely financial and institutional , but technological – can change a lot in two or three years; they can make some aims more realizable, or more desirable, and some less so.

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Process

How should a strategic plan be prepared? The problems and timescale should not be underestimated. The time required will vary according to the size of the library and to a lesser extent on the staff available; a sizable library will do well to produce a finished version within twelve months.

In practical terms, there are several ways in which a plan can be prepared. At one extreme, the librarian can do it all himself, taking advice as necessary from other members of staff. At the other, all members of staff can be involved in drafting. The best procedure is somewhere between these two extremes. There are, I believe, three basic requirements that need to be met: a single coordinator; a team to oversee the plan, to monitor progress and to decide priorities for particular aspects that cannot be decided by the section drafting; and the participation of as many staff as possible. The reason for the first is obvious; the person in question should be a good drafter (beacause various styles of presentation etc. will need to be homogenized), but need not be very senior. The reason for the team is also clear; the members should represent a spread of interests and views, and carry a fair degree of authority. They may be staff at the second or third level in the library. If the librarian is not included in the planning team he will probably wish to see the plan from time to time during drafting.

My third requirement, the involvement of as many staff as possible, needs more explanation. One major product of the strategic planning process is a consensus among staff as to the nature and objectives of the library. In fact, it is not merely a product, but a prerequisite for a successful plan; for unless the plan truly represents the views of staff it is unlikely to be achieved, since they will not be convinced by it and may even be offended and demotivated by the presumption that the boss knows best for them. The first part of the plan, the mission statement, must be an agreed statement. Chapters of the plan should be drafted by the departments of the library that are closest to them; department heads should not do all the drafting themselves but consult with their staff – *all* their staff – at the discussion as well as the drafting stage. One obvious problem with this approach, that the plan may be too down-to-earth and unimaginative, can be avoided if there is good and constant interaction between the planning team and the drafters.

In addition, a library may benefit from the assistance of a facilitator with experience in strategic planning. Few libraries can claim to have much experience themselves, and such a person can be helpful in providing perspective and seeing points that may otherwise be missed.

It will be understood why the preparation of a strategic plan takes so much time. There may be a temptation to cut corners and save time, particularly if the library is under pressure from the institution to produce a plan: but if this is done the results are likely to be so inferior, not only in the plan itself but in the effects on staff, that the temptation should be firmly resisted. The fact that in the next few years many libraries will be under pressure to produce a plan is a very good reason why they should start now, so that they are not forced into doing a hasty job later.

Follow-up

It is all too easy for a library, having gone through the quite exhausting process of producing a strategic plan, to sit back in relief and then discover in a year's time that few of the actions have actually been taken. It is essential to monitor progress. Monitoring would normally be the task of whatever internal management committee the library had; this would review progress every three months or so. However, a five-year plan cannot be precise about dates and persons responsible for actions, so that monitoring is very difficult.

It is therefore valuable – I would say essential – to follow up the strategic plan with annual

operational plans, specifying precise targets that will be met within the coming year, when they will be met and who is responsible for meeting them. These are much easier to monitor, and they also oblige all staff to take the task of implementation seriously. Targets must of course be set within the objectives established in the strategic plan, but they can and normally should be set by the staff concerned and reviewed by the library's management committee; perhaps surprisingly, staff do not usually set themselves low targets. They also welcome the prospect of annual appraisals based on targets rather than on the vague review of the year's performance that such appraisals are apt to consist of.

The first operational plans can be almost as hard to construct as the strategic plan, but subsequent plans are much easier. In the case of both strategic and operational plans, it is more an attitude of mind, a systematic way of looking at the library's operations, than particular skills that is important.

Effects

The purpose of a strategic plan was outlined at the beginning of this paper. Does it actually serve the purpose, and what other effects are there?

Strategic plans in libraries are too recent a development for much effect to be noticeable yet. At the least, a parent body can hardly ignore one; and almost certainly it will be impressed by its existence. At best, it will help to put the library on a much firmer footing with the institution. It is also difficult to say what would have happened if the library had not had a plan – whether the institution would have dealt much more hardly with the library, or whether it would have made no difference. This all assumes that the plan is a good one; a poor one will almost certainly be counter-productive. In any case, the library may be given no choice but to prepare a plan: in such a case the effects of not preparing one can be imagined.

The effects on staff may be more confidently stated. If the preparation of a plan is presented as an awesome and unwelcome task, staff will resent it and regard it as an intrusion on the ordinary work they have to do in the library: it will seem to them absurd to discuss future plans, including some for dealing with backlogs, if the time spent on drafting results in a growth in the backlogs in question. For this reason alone, it is vital that the reasons for the plan are fully discussed with staff at the outset, and their commitment obtained. This may not be easy.

In fact, if the preparation of a strategic plan is handled properly it can have a highly beneficial effect on staff. The drafting of an agreed mission statement alone makes them think about the library as a whole, and what it is really about; they probably all have their own half-formulated ideas, but it is a different matter to articulate and share them, and to reduce disagreements until a consensus is reached. Similarly, the process of drafting and agreeing sections of the plan can bring into the open misunderstandings and gradually create greater cohesion: teams begin to emerge in place of sets of individuals. At the same time staff have to familiarize themselves with more systematic and quantitative thinking, and to approach their work from a viewpoint of cost-effectiveness and with a view to establishing priorities. Thus the development of staff, both individually and corporately, can be greatly enhanced by the construction of a strategic plan.

In the process of preparing a plan staff have to think fundamentally about the library's nature and purpose and whether it is achieving its aims at present. It may well be found that the present structure and management style of the library need to be changed if it is to tackle the future with any confidence. It is not unusual for the library to undergo a fairly radical reappraisal during the process of constructing a strategic plan, and to finish up as a rather different sort of organization. Even if the impact of a strategic plan on the parent body may

be somewhat disappointing, the library and its staff are likely to end up in a better position. Strategic planning can be a catalytic and creative force.

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Library Staff Development Consultancy:
a means to achieve a better library?

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Abstract
Library staff form the single most important component in achieving library service of quality. Good management practice is now recognised as being at least as crucial for the achievement of a successful library as professional skills. Even though staff development is a key responsibility of management, an outside consultant can provide stimulus at all levels in a library which management alone cannot do. A successful consultancy has potential of improving the whole "culture" of the library, and thus providing better services to users.

Library staff form the single most important component in achieving library service of quality. However considerable the collections and other resources, no library will function, even adequately, unless its staff are performing effectively. Professional skills and academic knowledge are important, but commitment, sense of purpose, and clarity of objectives are even more so. The achievement of organisation to bring these things about is a central function of management. Individuals are motivated by such material incentives as remuneration and the opportunity for self advancement. To perform well they also require the self esteem brought about by doing tasks that are clearly worthwhile in themselves, and demonstrably relate to the larger functions of the organisation. Effective communication is central. On the one hand, the policies and practices laid down by management should be within a context that is obviously rational to junior employees and, on the other, there should be routes for junior staff to pass information and suggestions upwards to influence overall policy.

The overriding need for good management practice is now recognised in every textbook for librarians, and in many countries training is available for all levels of staff, right up to directors of libraries, to improve skills and to ensure that library managers are kept in touch with the latest thinking and techniques. Understanding in theoretical terms how the library as an organisation should be functioning, however, is one thing; achievement within an individual library is quite another. The human predicament is that individual perfection is not obtainable this side of paradise. The same is true of an organisation. No library on earth can ever achieve a state where all staff are always productive, happy, carrying out tasks they enjoy, within an organisation whose aims they totally comprehend and support. There are, however, clearly better and worse situations. At worst a substantial number of library staff members can be deeply unhappy in their work, seeing their immediate tasks as boring and futile, the overall organisation as inefficient and without useful goals, their bosses uncaring. The very functions of management can be usurped by militant trade unionism, filling a vacuum. Such depths are uncommon in libraries, where a sense of mission and service is one of the reasons why people are attracted to make careers at all the levels of library work, but there are few institutions so continuously well run that such alienation does not occur in an endemic way amongst some groups of staff or within some departmental areas.

The pace of change in libraries is accelerating all the time. Not only new technology and new services but also changing expectations, particularly on the part of those who fund librar-

ies, produce new pressures. Greater accountability coupled with increasing expectations, at least in some places, that libraries should operate more in the market, raising significant amounts of funding by direct charges, make the task of management within a library more and more complex. Senior staff in libraries tend to be far more uncertain about their management skills than they are about their professional, and welcome help particularly in a form that does not undermine their authority or status. Library staff development programmes are the only way in which the challenges can be appropriately met, by staff whose natural careers will range through many substantial changes of circumstance.

Why a consultant?

Consultants are normally brought into an organisation to provide advice on specific problems about which there is either inadequate internal expertise or on which an outsider's view is considered desirable. Automation is a common area where a consultant might be employed, to advise, for example, on the choice of an appropiate system for a library. Acqusitions policies are a field where a fresh eye can be particularly valuable. In the United Kingdom it has become increasingly common to employ consultants in a rather larger way. Management consultancy is one of the fastest growing business in the country. There is even a popular television programme where a former Chairman of Imperial Chemical Industries goes, on a weekly basis, to a different business, and analyses for the benefit of its directors, and the T.V. audience, how it might be put on a more profitable footing. In the public sector, government policies are to give preference to private sector involvement wherever possible, and it has become common practice for consultants to be involved at many levels of public administration. The Department of Social Security, for example, spent £19m. on consultants in 1987/88; £35m. in 1988/89. Where central issues of practice are involved, there is some disquiet that the use of consultants both weakens managers an absolves them of their key responsibility for the satisfactory conduct of their organisations' business. Is not employing a consultant on staff development within a library an acknowledgement of failure on the part of the library director? Advice on staff development from an outsider is not the same as advice on the choice of a copying machine. The consultant in the latter case is in the organisation for a limited period of time, considering a specific issue. His advice can be accepted, rejected or modified with little pain and no "loss of face". As will be shown shortly a consultancy on staff development should probably run for at least two years. By the very nature of the exercise, the entire organisation – objectives, culture, resources, personalities – is under scrutiny by an outsider, whose job it is to talk to staff members at every level. It would appear that a library director, voluntarily submitting his or her organisation to such scrutiny and his staff to such possible sedition, is either desperate or foolhardy. There are undoubtedly risks, certainly substantially more labour for the director and other senior staff, but the potential rewards are also considerable.

A consultancy in staff development is not an old-fashioned study of organisation and methods, with the outside expert laying down what should be done. No report, other than of the most formal kind, is necessary, and the consultant is responsible to the library director, not to an overriding authority. The absence of direct threat to any individual in the organisation is in fact an important component in the process, and a fundamental reason why a consultant can achieve more than the manager, even though staff development is an essential responibility of management. The object of the consultancy is to stimulate staff members at all levels in the library to examine what they are doing and why they are doing it, and from this analysis for staff themselves to design an evolutionary path towards improved ways of working, and thereby achieving service of higher quality for the users of the library. The resultats are potentially revolutionary in their effect on the organisation, but the changes

would be gradual, controlled by checks and balances of hierachy and existing order.

The outside consultant can stimulate such a process because he or she is outside the management hierarchy. He obviously must possess expertise and other qualities, but he also has the advantage over the manager that he can concentrate on staff and their organisation, unencunbered by direct concern over problem of funding and other resources. Such single-minded attention to one facet of management, albeit the most significant, can be highly irritating to the library director, necessarily involved with the total range of problems, but the discipline is an important part of the process; senior management are effectually taken to task every time adecision is made (or not made, when it should have been) on an arbitrary or disconnected basis.

The role of consultant in such a situation is clearly very demanding. Actual experience of management of a library is invaluable but so too is experience of generalized personnel work in any large organisation. A consultancy team of two people, between them having both sets of experience, would be easier to find than a single paragon. For the consultancy to work well a large number of qualities are needed. To quote the British Prime Minister about herself, "lots of stamina, and firm, fundamental convictions"are necessary, but combined with an ability to listen and draw out people who are not necessarily inclined to be communicative about their problems at work. Tact and confidentiality must be mixed with a need to demonstrate to individuals hard facts which they may not particurlarly wish to face. On the other hand, there should be no belief on the consultant's part that he is Superman, better able to manage the library in every way than those he is advising. He does not have to be. Stimulation can be given almost as much by irration with a consultant's failure to understand the true complexities of a situation as by a diagnosis that is immediately obvious as penetrating and fair. The ultimate decision regarding the conduct of business within the organisation remains for the organisaton itself to take. The consultants guides and persuades only. To quote Sir John Harvey-Jones, the ex-chairman of ICI, about his television programme, "The companies who called me in are the real heroes, for their openness. They have a bum like me come in and spend a couple of days and then they do things. Its fantastic".

The methodology of staff development consultancy

For all but the smallest libraries contemplating such an exercise it is crucial to realise that it cannot be rushed. Two years form perhaps the minimum period for a process that is intended to change radically the "culture" of the library, with visits from the consultant on a weekly basis in the early period of the consultancy. The consultant must become a familiar figure. A great deal of talking needs to be done. Exercises in analysis and planning take time. And, obviously, the "normal" work of the library must go on.

The consultant will require resources, most notably the time of a lot of people, particularly of those who are the busiest anyway. He will require the near full-time assistance of a senior member of staff, initially to facilitate the exercise by arranging and following up meetings and generally co-ordinating what is going on, eventually perhaps becoming a staff development officer for the library. The process is not cheap, the consultancy fees probably not forming the largest segment of costs. However, in proportion to the medium or large size academic library's expenditure on staff, the outlay is not large, at least not when put in the context of the anticipated benefits in producitivity.

A useful focus for the project can be a strategic plan, either one already in existence or drawn up as part of the exercise. In the former case it should be stated that any pre-existing strategic plan is likely to be modified considerably in the process. The consultant does not write the plan; he encourages library staff to do it for themselves, providing advice and criticism while the process is going on. The strategic plan must start with the library's aims and

objectives which will require the governing bodýs formal endorsement. The overall plan will form the strategic framework for a series of operational plans, covering all areas of the library's acitivies and written primarily by the staff in these areas. The labour is considerable and the intellectual efffort is great, but those responsible for operational plans have no choice but to think through what they are doing in particular areas, why they are doing it, how effectively tasks are being carried out, and their relevance to the overall objectives of the library. True costs need to be worked out. Measures to judge future performance can be laid down. An essential constraint is insistence on the establishment of priorities within existing or limited resources. Where individuals and departments feel themselves to be overworked – as they all do – any solution to this overload must be found by changes in priority and method, rather than on the expectation that a benevolent magician will appear to wave a magic wand.

The analysis of decision making and communication within the library is a central feature of a consultant's role, where the outsider's perspective is likely to be very different from that of an insider, whether a manager or a subordinate. In almost any organisation it is in this area that most bitterness is expressed by members of the organisation. "We were not told", "we were not consulted", "we had no opportunity to provide information which would have resulted in a better decision". these complaints are very familiar. Equally familiar is the converse from the management side. "He (or she) is lazy"; 'no commitment to the library", 'not prepared to take responsibility". . . The outsider can hear both sets of complaints.

Meeting with individuals, or with groups, informal and unattributable comments will be made to the consultant. Junior library assistants can be particularly revealing in such circumstances, with comments on what they are doing, the attitude of their bosses, and the training (or lack of it) they have received. These comments are often disingenuous and misleading, sometimes more revealing of the personality of the individual than the health of the organisation, but the skilled consultant will quickly be able to distinguish truth from imagination as he becomes more and more familiar with the environment of a particular library. He should also have access to such revealing statisics as absence and lateness records, very good indicators of underlying morale.

The data gathered from such meetings can be matched with the formal and the informal communication structure of the library. How are decisions made and promulgated at all levels? How do members of department A find out about and influence decisions made in department B that impact on their own work? Fundamental communication blockages, previously invisible to library management, suddenly become blindingly obvious with the help of the outside eye.

Does a consultancy achieve a better library?
A consultancy could be a failure for more than one reason. It should not be attempted if the library director is unenthusiastic, and the consultants must be acceptable to him. If there is no trust between the director and consultant the exercise will fail. It is inevitable that the consultant will make many un palatable suggestions doing his work; any hints that the consultant does not have the backing of the director wil be picked up at once.

The consultant must have considerable social skills, rather different from those of a manager. Considerable patience with what must seem at times stubbornness, and an acceptance that the ultimate decisions do not lie with him. To use a medical analogy he is a psychiatrist rather than a surgeon. The patient must help himself. No knife can be used. If personal relations show signs of breaking down under the stress of the consultancy it should be abandoned.

The library which I direct is now near the end of the second year of a staff development consultancy. Its "culture" has changed for the better as a result. Individuals, including

myself, have become more perceptive and perhaps more effective managers because of the stimulus of the exercise. A number of organisational changes have been made, although not so many as were made in the two years before the consultancy began, when many systems were deliberately altered fundamentally. The internal governance of the Library, however, has been considerably improved. The library has a strategic plan of higher quality than if it had been produced without such outside assistance. My favourable comment are the view from the office of the library director, but they would be echoed by my senior management team and I believe, by the majority of the library staff. There has been a genuine change atmosphere, with greater input by people at all levels into how things are done in the Library. I believe there is a feeling among junior members of staff that they have more "say" about how their jobs should be carried out. The process has been a mixture of excitement an frustation. The amount of additional work required cannot be overstressed, but nor can the pleasure of having individuals of stature and perception working with you on the central problems of achieving better service within your own library. It is too soon within my own Library to state categorically that the benefits to individuals and the organisation will be parmanent; but there is substantial optimism that the uplift in morale, and new found commitment to the positive development of the Library's services, will result in lasting and tangible benefits for our users.

Why User Education and how can Information Technology help?

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1. The role and organization of user education

What is the role of user education? One aim is to make the user aware of the information resources available, both directly in the library and from external sources. A second goal is to enable the user to enjoy the search for information.

User education can be organized at several levels: orientation for new users of libraries and/or information services; programmes of information retrieval for undergraduate students; courses in information retrieval for postgraduates and/or research workers; courses for academic staff; continuing education – courses for "external users". During the last twenty years there has been a growing emphasis on programmes of user education in many Nordic academic libraries, particularly specialized libraries for engineering, medicine and economics. Many of the Nordic user education programmes reflect the new methods for information storage and processing. This paper will examine some of the effects of information technology as applied to user education.

2. The main features of information technology

We sometimes talk about the present period as "The Age of Information Technology". The main features of recent development in information technology can be summed up as follows:

- Increased computer power leading to speedier and cheaper computer processing;
- Cheaper data storage – for example optical storage media;
- Digitization of information – text, graphics, photographs, speech, sound, video, etc.;
- Better data transfer between different systems and media;
- Improved telecommunications, such as ISDN, with greatly increased capacity for data transmission;
- Decreased size of equipment;
- Increased reliability of hardware and software.

These have led to the development of international, national and local online systems, automated library systems, public access catalogues (OPACS), the electronic journal, electronic "knowledge banks" and expert systems, CD-ROM (Compact Disk Read-Only-Memory), optical digital disks, and interactive video for storage of databases, journals, reference publications and picture databanks. There has been a very considerable increase in the amount of information available in the form of full-text documents, bibliographical references, factual and numerical data and, at the same time, an increase in the complexity in information handling and storage systems.

Any systems are beginning to exist in parallel – paper-based media and documents stored in digital form either locally, in online full-text stores, or on optical media. This points to an increased need to teach information users how to select and use the most suitable tools for their information needs.

3. The use of online databases

3.1. Library catalogues

The first automated library systems were run on mainframe computers which had high processing and storage costs and were often shared between several users. The next generation was based on minicomputers, often providing dedicated stand-alone library systems. These did not greatly reduce costs but gave the libraries better control over the system. The present trend is towards the use of microcomputors, either used singly or in networks. The cost will thereby drop and automated systems become more affordable. Online Public Access Catalogues (OPACs) or public enquiry terminals have brought about considerable improvements for the user with regard to searching for literature, particularly that available in book or monograph form. OPACs need a simple and straightforward user interface in order to be easy to use for inexperienced library patrons. At the same time they must be based upon fairly sophisticated search techniques in order to be able to deal with the complex library catalogue files. Computerized library catalogues are based on the standardized MARC record. Today many OPACs unfortunately do not fully exploit the information stored in the record, but only allow users three types of access: author, title and subject and show considerable resemblance to the library card catalogue entry. It would be possible to structure MARC records so that any separately tagged data element would be accessible, in Boolean combinations with any of the others. Many investigations have shown the importance of subject searching in the OPACs and much development work is being directed towards enhanced subject searching (Walker and Jones, 1987; Dempsey, 1988).[1, 2] The possibility of transaction logging enables the librarian to be able to follow unobtrusively how users actually use the OPAC. This provides valuable information for systems design and also for the design of appropriate user education modules.

How does the development of library automation and OPACs affect user education programmes? Frances Nowakowski has recently compiled an annotated bibliography on Bibliographic Instruction for Online Public Access Catalogues. This is divided into four parts (1) Bibliographic instruction for OPACs in general; (2) Specific systems; (3) Survey results affecting bibliographic instruction; (4) Survey instruments. (Nowakowski 1988).[3] The bibliography includes both theoretical and practical papers and aims to provide a useful resource list for those designing user education programmes in relation to the OPAC.

3.2. Bibliographic database – local, national, international

There are now over 5,000 publicly available online databases running on host computers on over 500 information retrieval systems. The relative complexity of the first information systems led to a situation where the one-time or infrequent end-user often asked for help from an intermediary or information specialist with systems knowledge. More and more end-users are, however, learning to carry out their own online information searches. This is partly the result of improvements in hardware and software and partly due to the problems of describing exactly the information required to an intermediary – the search negotiation process – no-one can judge the relevance of possible interest of information as well as the user.

Database structures vary considerably and depend on the producer. There is no recognized universal format and little trend towards standardization. Present-day information retrieval languages are command-based and fairly complex. Most host systems have their own specific search languages, sufficiently similar to be confusing to the infrequent user.

Even given the current disparity between systems and databases, it is possible to train end-users to carry out their own searches, providing this is limited to one host system and a small number of databases. There are a number of tools available for this purpose; general manuals or textbooks, documentation produced by the systems' operators, video films and computer-

based simulations or CAI (Computer Assisted Learning) programs and emulation programs (Fjällbrant, 1988).[4]

User education about online searching is concerned with:

1. Orientation about what online search facilities are available, to what extent users can obtain access to such systems (either with the help of an intermediary or themselves), where searching can be carried out and how much it will cost.
2. Instruction in how to prepare and carry out searches.

Three types of skill are necessary for carrying out interactive computerized information searches: subject knowledge; skill in using the terminal or PC; knowledge of the information system to be used – the appropriate commands, type and quantity of information available, database structure, etc.

The following factors have contributed to easier online searching for end-users: the vast increase in the number of personal computers; improved telecommunications hardware and software; and the development of user-friendly communication programs which enable the end-user to prepare a search offline, taking as much time as necessary and being able to correct mis-spellings and typing errors. The development of standardized search command languages such as the European Common Command Language. User friendly systems have been developed by a number of systems operators. This interface provides an easy menu-driven user access to databases on the specific host system. Examples are BRS's AFTERDARK and DIALOG's KNOWLEDGE INDEX. Finally, the use of artificial intelligence and expert systems to provide user-friendly interfaces where the user can communicate with the system and databases in natural language.

One problem for the end-user is that, if searching is carried out at infrequent intervals, it is possible that the search commands feel unfamiliar. One way to overcome this is to make use of "refresher training" in the form of simulation programs in which the user practices offline on a simulation of the online system. A number of simulation programs are available. Examples are *MEDLEARN*, QUESTSIM (ESA-IRS), DIALSIM (DIALOG) and STN-MENTOR programs.

3.3. Videotex databases

Videotex is the name for screen-based systems that make use of the telephone and television sets. Viewdata (sometimes simply called videotex) is a computer-based interactive service which uses the public telephone network to transmit information and the TV-screen as a display device. Examples of viewdata are British Telecom's Prestel service, established in 1979, Bildshirmtext (BTX) in West Germany, Teildon in California, the Pronto home-banking system of the Chemical Bank in New York, and the Teletel system of France.

It is impossible to access large database vendors through videotex. Examples are The Source, originally a consumer-orientated system which has moved into business information, and Dow Jones with an almost exclusively business focus. Searching is menu-driven. In Britain a number of agricultural organizations have been made user-friendly for inexperienced users, but the menu-driven searching is time-consuming (and therefore fairly expensive). Searchers used to the traditional command-driven online services often experience frustration in videotex searching.

If the library has access to a videotex system, this can be used for providing library news – opening times, services available, schedules of courses, their content and possible cost. Videotex services can also be used for interlibrary lending transmissions, as well as access to databases. A short demonstration of available videotex services and locally available databases would be of interest in a user education programme.

4. Optical storage of information

Recent developments in optical storage technology have provided a cheap storage medium for information. At the beginning of the "seventies" Philips introduced an optical video system-laser vision discs. These contained video pictures encoded in analogue form on a 30 cm optical disc. The first discs were intended for entertainment and the pictures were stored in a straight sequence through the 54,000 tracks in Constant Linear Velocity (CLV) format. Later, storage in the Constant Angular Velocity (CAV) format was introduced, with one picture per track. This allows a unique address for each frame and the possibility of searching and rapid access. This meant that the laser discs could be used for educational and training purposes and for storage of picture libraries or art collections. Examples of this type of use are at the Library of Congress for the storage of prints, poster and photographs (Welsh, 1985)[5], the British Domesday II project (Leah 1987)[6], and the Emperor-I project (Chen, 1986)[7]. The latter is a joint project between the Peoples' Republic of China and the USA, with the aim of presenting the archaeological finds associated with the grave of the first Chinese emperor Qin Shi Huang Di. These include the army of terracotta soldiers at Xian. Laser discs can be used to introduce users to picture databases.

Compact discs are a type of digital optical disc which are 12 cms in diameter. Compact discs are the result of cooperation between Philips (optical storage technology) and Sony (error correction coding) which started in 1979 and led to a commercial product – the Compact Audio disc in 1983. CD-ROM stands for Compact Disc – Read Only Memory and is a further development of the CD-Audios. Good overviews of the development of Compact discs and CD-ROM are given by Hendley, 1987[8] and in the book CD-ROM the new papyrus (eds. Lambert and Ropiequet, 1986).[9]

A 12 cm CD-ROM disc contains approximately 8 billion pits burnt into a 5 km track. The disc can store 550,000,000 bytes of information. The CD-ROM disc is, therefore, an excellent storage medium and can be used together with widely available low-cost micro- or personal computers to provide relatively powerful distributed storage and processing devices, which are not dependent on telecommunication systems. Material that has been created electronically – such as databases – can be saved and distributed in this form.

In user education programmes, databases in CD-ROM form can be used with advantage to provide end-user access to databases. They allow the user to work at their own speed without having to worry about telecommunication connect charges or costs for host computer time. They eliminate telecommunication faults, which can be a problem with online searching. The 1990 edition of CD-ROMs in Print has over 600 entries of commercially available CD-ROMs. These include many databases and reference tools such as encyclopedias.

There are some disadvantages in using databases in CD-ROM form. Present-day technology is directed to single user stations, though network alternatives are beginning to emerge. The biggest drawback is that the databases are updated less frequently than the online base. Although there is a considerable degree of standardization in CD production, size, error-coding, etc., there is little standardization of the search languages, so that users are today faced with over 100 alternatives. This is another example of the increasing complexity of the information world. It is important to provide clear instructional material in printed and/or digital form for the user.

5. Document ordering and delivery

It is not possible, by means of the online systems described above, to obtain bibliographic references within a matter of hours. Obtaining the corresponding documents can, however, take from a few days to several weeks. It is very important, in user education, to describe the document ordering and delivery service, so that the user is aware of the options and costs

involved. Choice of method for document supply is important with respect to three criteria: (1) chance of satisfaction; (2) speed of delivery; (3) cost. For both users and librarians it is important to make a good choice of document supply system and balance these factors. For example, study of the pattern and time for publication can make the user aware that it may be easier to obtain a journal article which corresponds to a somewhat older conference paper. It is usually easier to obtain the former.

The typical requirements of the end-user with regard to full-text documents may be summed up as follows: The right information, at the right time and for a reasonable cost. This is based on:

1. A straightforward system that is easy to use.
2. High chance of satisfaction -- for the requested documents.
3. A reliable system.
4. Reasonable speed of supply – with the possibility of fast transmission for urgently required documents.
5. Low costs.
6. The facility to assess content, quality and cost before ordering.
7. Document output in a form that will permit the reproduction of text, diagrams, photographs and formulae.

Recent technological developments in computing and telecommunications will certainly affect future document supply and these could form a topic for discussion in an advanced course on information retrieval (Braid 1989).[10] Speed of delivery from a document supplier or library can be much improved by Group 4 telefax transmission or by satellite transmission of documents. The latter is particularly important in countries which have rather poor terrestrial telecommunication lines, or where such lines can be disrupted by earthquakes, landslides etc. Group 4 telefax is based on digital transmission over a digital datanet – ISDN or Integrated Digital Services Network – and results in high quality copies (300 lines per inch) at a speed of about 16 secs per A4 page. The use of Group 4 fax transmission should lead to a rapid, reliable and cost-effective document delivery service in countries where ISDN networks are available.

6. Electronic publishing including fulltext databases

In the last ten years a number of technologies have been developed which allow local access to fulltext documents. This means that users will potentially be able to obtain vast quantities of information directly from a personal computer. This access can be achieved in many forms: fulltext online databases, electronic journals and newsletters, CD-ROM, digital audio tape, laser cards or smart cards. These provide alternatives to the traditional paper publishing medium. A presentation of the new media could form an interesting discussion topic in an advanced course in the use of information sources.

Computer storage costs continue to decrease with improved VLSI techniques and methods of optical storage. This facilitates storing and handling full-text documents in digital form, for example on CD-ROM discs. This in turn could lead to a reduction in the handling costs for document suppliers and to the possibility of fairly cheap distributed document supply with CD-ROMs available for end-users. The development of user-friendly gateways will make it easier for users to locate and order documents directly from suppliers. Cheaper storage and telecommunications will facilitate the transmission of fulltext documents, as mentioned above.

The DOCDEL projects, sponsored by the European Commission, included work on fulltext electronic journals – the Electronic Magazine, produced by Learned Information, U.K.

Electronic journals in Chemistry – prototypes of the electronic Journal of Chemical Research (Synopses) and Chemical Communications, the Royal Society of Chemistry, U.K. and a mathematical online journal, by the Commissariat a l'Energie Atomique, France. Another DOCDEL project was concerned with the electronic publishing of patent information (Fachinformationszentrum (FIZ 4) and Gesellschaft für Information und Dokumentation, BRD) and this has resulted in a database PATDPA available via the STN online system (Van Slype, Page & Halm, 1987).[11]

Patent information is based on both text and graphics and forms a particularly interesting area for optical storage and publishing media. The American US Patent and Trade Mark Office (USPTMO), the European Patent Office (EPO) and the Japanese Patent Office (JPO) are involved in a cooperative project involving the storage of patents on optical discs.

CD-ROM provides a medium suitable for the publication of reference works such as encyclopedias and dictionaries, patents and standards, textbooks, technical documentation, full-text journals, and referral databases such as those corresponding to secondary publications. In particular CD-ROM has many advantages for the production of reference works, which do not require continuous updating. It has some disadvantages as a medium for referral databases and learned journals in that the publication pattern is serially dynamic and there will be problems in updating.

CD-ROM can be used for fulltext journal publishing, which could potentially greatly improve document access. In this connection two projects can be mentioned – ADONIS for biomedical journals (Stern, 1988)[12] and the INSPEC IEE and IEEE project within electrical, electronic and computer journals.

7. Construction of personal databases

An increasing number of library users now have access to a terminal or personal computer. These can be used to store references in a personal reference system. This involves the design and construction of a small database system. An advanced user education course could well include the design and use of a computerized personal reference system. The course could, for example, start by briefly describing what is meant by a database, and data management systems. This could be followed by guidelines for the structure of a bibliographic database and examples of software for personal reference systems. Students would preferably be given the practical opportunity to design and use their own personal reference file.

8. The use of electronic mail

A relatively new form of communication is electronic mail. It provides a semi-formal method of direct communication which can be extremely useful in that it is quick and relatively cheap. In contrast to telephone messages the recipient does not have to be at the receiving terminal, thus global timedifferences are of little of no importance. The term electronic mail or E-mail covers the transfer of digital messages from one computer terminal to another. There are a variety of E-mail services available:

1. Public Access Systems. A number of these are provided by the telecommunication companies in various countries, for example: United Kingdom – Telecom Gold, Sweden – Telebox.
2. Services available for the use of specific user groups, such as academics and research workers. Examples are ALANET a service for libraries, based on Dialcom software, provided by the American Library Association, and Advocnet used as a link between people working in vocational education. In the United Kingdom there is the COPOST Network started by the Council of Polytechnic Libraries, but now extended to university and national libraries.

3. Many firms provide privat E-mail systems to link their employees based on one or more sites.

One problem with electronic mail has been that the various systems do not necessarily communicate with other. One way of achieving communication between different systems is by means of a gateway service such as BITNET. BITNET (Because It's Time NETwork), launched in 1981, is a network of institutional and departmental computers at some 400 institutions of higher education and research centres in the United States. BITNET also has connections to NET North (Canada) and EARN (Europe), and has nodes in Chile, Japan, Korea, Israel, Mexico, Taiwan and Singapore and planned extensions to Australia and China, Bitnet provides gateway links to other E-mail networks such as ARPANET (Defense Advanced Research Projects Agency), CSNET, UUJCP, and national academic networks such as JANET (United Kingdom) and SU-NET (Sweden) – Adams, 1990.[14] It is hoped that the recent introduction of the CCITT X.400 standard for electronic mail protocols and its gradual adoption will lead to considerably better communication between systems. The use of a standardized protocol means that messages will be able to be switched independently of the carrier.

One particularly interesting aspect of electronic mail is that it can be used to provide electronic conferencing facilities between users interested in a specific field or topic. This allows the users to exchange news and views and to seek advice from others with similar interests. Examples of such conferencing systems are COM developed by the Stockholm University computing centre QZ and the British CIX (Compulink Information Xchange) system. A user can select which conference(s) to belong to. Many of the conferences are computer-oriented, covering such areas as the use of certain types of software or hardware.

In additon to the conference systems there are also Bulletin Boards, where one message is sent to a group of users. These tend to be much smaller systems. Many bulletin board systems can be used for the price of the telephone call to connect in to the system. They can provide articles about the use of a given PC such as the Macintosh. Many include a facility for leaving a message.

The topic of electronic mail provides an interesting example of changes in the pattern of communication between workers and practitioners, and such, merits inclusion in a general introduction in a user education programme. It can well be introduced at a practical level in advanced courses, where the following factors can be considered:

- How to select a suitable E-mail service for your needs. This can be based on:
- Whom do you want to communicate with?
- What type of materials do you wish to send/receive – mail, diagrams, etc.
- Which systems do they use?
- What hardware is available – can you use existing equipment?
- Is the system user-friendly?
- Are there gateways to other systems?
- What will it cost? (Hardware, software, E-mail service fee, communications charges, training costs, documentation).
- Examples of existing relevant services.

9. Information technology and user education in a global context
Information technology has two main effects on user education. On the one hand, the growing complexity in information handling and storage techniques brings about a greater need to teach users what is available, how to choose the most appropriate tool for their needs and

how to use it efficiently. On the other hand, new methods of digital processing and storage provide excellent tools for teaching purposes. Information technology can break down barriers in the future. The new methods of storage and access may well prove to be invaluable for the development of systems for information transfer and document delivery in developing countries, for example by making databases available in an easily transportable form and by providing methods of document delivery where cost is independent of distance. It is important that the librarians of so-called "developed" countries share their technology products with third world countries. It costs considerable time and money to develop computer aided instruction programs. Let us try to share with other users throughout the world. This is perhaps an area where the international organizations, such as IFLA, FID and IATUL could play an important part.

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La Maîtrise Stratégique de l'Information Composante Essentielle de la Formation des Ingénieurs

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1. Les ingénieurs et la maîtrise stratégique de l'information

Il a été dit que les ingénieurs utilisaient désormais l'information comme une ressource primaire essentielle. On sait également (5) que l'information – sous toutes ses formes – représente désormais une part essentielle du coût de fonctionnement des entreprises modernes.

Alors, doit-on considérer que tout va bien? Doit-on considérer que l'information, aussi disponible et accessible que l'air, ne doit pas être gérée, «managée»? Doit-on se satisfaire de pratiques d'informations archaïques, fondées sur un pragmatisme dépassé, au moment où l'entreprise est confrontée à la concurrence internationale et s'efforce d'accroître la compétitivité de ses produits?

Toutes ces questions naissent du constat qu'en fait personne dans l'entreprise ne sait vraiment gérer le patrimoine informationnel, personne ne sait vraiment mettre en oeuvre une politique active de management de l'information, personne n'est en mesure d'évaluer les conséquences désastreuses d'une mauvaise maîtrise de l'information spécialisée.

Si beaucoup d'efforts ont été faits dans les dernières années pour améliorer le management des ressources humaines, si des modes se sont développées amplement dans le domaine de la «communication» (l'entreprise est desormais plongée dans un univers de signes et de médias), par contre, rien n'est sérieusement fait pour gérer l'information scientifique, technique, économique, encore appelée information spécialisée.

Lorsqu'on visite des entreprises, lorsqu'on interroge des ingénieurs, il est courant de relever les dysfonctionnement suivants:

- très peu d'ingénieurs et de techniciens visitent des bibliothèques ou utilisent des centres de documentation et encore moins interrogent des bases et des banques de données;
- beaucoup de professionnels (ingénieurs ou autres) produisent en permanence de l'information spécialisée (essais en laboratoires, spécifications techniques, dessins, notes de synthèse ...), mais, à l'exception de quelques grandes sociétés, rien n'est fait pour gérer correctement ce patrimoine informationnel;
- une majorité d'ingénieurs ignorent les régles de base relatives à la protection de leurs idées, de leur savoir ou savoir-faire: comment et pourquoi breveter une invention, comment se prémunir contre les menées d'agents de renseignement (espionnage industriel ...);
- une incapacité à trier et à déceler l'essentiel parmi des flots surabondants d'information et de documentation et une difficulté sérieuse à extraire, par analyse statistique, des lois de comportement à partir de multitudes de données hétérogènes;
- de sérieuses difficultés pour les ingénieurs à échanger des informations spécialisées, à communiquer leurs projets a des décideurs, et plus généralement à communiquer avec des spécialistes de disciplines differentes.

On peut énumérer ainsi une longue série d'insatisfactions qui au fond renvoient à une seule et même interrogation: a-t-on jamais formé ces ingénieurs à savoir se comporter face à cette exigence de l'information efficace?

Mais avant d'aborder très concrètement la question de la formation des ingénieurs, il est souhaitable de préciser certains termes et de définir les concepts de management de l'information ou encore de maîtrise stratégique de l'information (MSI).

Information, oui bien sûr. Mais de quelle information parle-t-on? En ce qui concerne les ingénieurs, il s'agit de tout ce qui est relatif au savoir-faire de ces professionnels (information scientifique et technique, par exemple), mais aussi de tout ce qui a trait à l'environnement dans lequel les ingénieurs travaillent: l'entreprise, le marché, la concurrence, les technologies, les coûts, les ressources humaines, le droit international, etc .. L'information dont les ingénieurs ont besoin est à la fois donnée brute (des chiffres, des faits) et aussi note, document, rapport (des textes, des références bibliographiques); l'information est donc primaire ou secondaire (selon la terminologie des spécialistes de l'information). Cette information est fondamentalement complexe, multidisciplinaire, contrastée, voire contradictoire. Elle est véhiculée, de différentes manières: contacts et échanges interpersonnels, supports écrits ou audiovisuels... L'information à prendre en compte est également un mélange de données ou documents produits par l'entreprise et ses spécialistes (information interne) et de ressources informationnelles ou documentaires externes à l'entreprise.

Maîtrise de l'information, *management* de l'information: ces deux mots signifient clairement que l'on veut se préoccuper de l'ensemble des activités relatives au processus d'information. En d'autres termes, on s'interesse tout autant à la production de l'information qu'à sa recherche ou son utilisation. On se préoccupe ainsi de savoir comment les ingénieurs produisent de l'information, comment l'entreprise gère ensuite l'information ainsi proudite: il faut savoir que les ingénieurs utilisent en priorité cette information produite au sein même de l'entreprise. On se soucie également de savoir comment les ingénieurs accèdent à des gisement d'information, comment ils formulent leurs besoins en information et comment ils mettent en oeuvre des processus de recherche de données ou de documents. Maîtrise ou management de l'information, cela signifie clairement gestion des stocks et gestion des flux d'information, évaluation économique des choix de solutions informationnelles, implication de différents acteurs ou intervenants professionnels.

Maîtrise *stratégique* de l'information: pourquoi un tel qualificatif «stratégique»? La raison principale du choix de cette appellation réside fondamentalement dans le constat que l'ingénieur est un élément déterminant du fonctionnement de l'entreprise. Au fond, le besoin en information de l'ingénieur est une composante du besoin en information de l'entreprise dans laquelle l'ingénieur travaille. Il ne s'agit donc pas seulement de penser la maîtrise de l'information comme quelque chose qui relève de préoccupations personnelles ou individuelles de l'ingénieur. Il s'agit bien plus sûrement de resituer cette maîtrise de l'information dans le cadre de la stratégie de l'entreprise, en prenant en considération l'ensemble des facteurs de compétitivité et l'ensemble des contraintes qui pèsent sur l'entreprise.

Ainsi donc *la maîtrise stratégique de l'information* (MSI) est cette aptitude que les ingénieurs doivent posséder s'ils veulent jouer pleinement leur rôle d'operateur de changement dans les entreprises. N'oublions pas que fondamentalement les ingénieurs transforment de l'information et du savoir pour pouvoir faire réaliser les produits ou services de l'entreprise. A la limite, l'action des ingénieurs peut se décrire comme un processus permanent de mobilisation, transformation et production d'information.

2. Former les ingénieurs à la maîtrise stratégique de l'information

Parmi les spécialistes des questions de formation d'ingénieurs, il est courant de distinguer plusieurs écoles selon que l'on considère l'ingénieur comme un généraliste ou comme un spécialiste et selon que l'on situe cet ingénieur dans la sphère de la technique ou dans celle du management. En Europe, notamment, il est tout à fait normal de voir ces points de vue, soit

cohabiter, soit s'opposer, soit s'ignorer (6).

Pour certains donc, l'ingénieur est au mieux un «super technicien»: d'«engineer» à «engine» la liaison sémantique est alors directe et prédominante. Dans ce cas, l'ingénieur apprend son métier en acquérant des «recettes» techniques, en fabriquant lui même des objets techniques et en essayant de s'intégrer à des entreprises pour des stages de terrain, généralement appréciés.

Pour d'autres, l'ingénieur est d'abord et avant tout un scientifique, c'est à dire un spécialiste d'une certaine discipline scientifique. Dans cette situation, l'ingénieur est très tôt inscrit dans un département approprié d'une Université technique, où il peut faire progresser son savoir au contact de professeurs, spécialistes éminents de la mécanique des roches ou des systèmes experts. Le travail de laboratoire et de recherche est alors une composante essentielle de la formation.

Pour d'autres enfin, l'ingénieur n'existe que par la réponse globale qu'il peut apporter à des besoins des hommes et de la société; il est principalement un «assembleur» de techniques et un gestionnaire de ressources diverses. Dans ce dernier cas, la formation met l'accent sur la multidisciplinarité et sur l'approche par les «besoins» et par l'économie.

On aura pu reconnaître dans cette présentation des cultures différentes de formation d'ingénieurs. Il faut donc bien comprendre que l'introduction d'enseignement à la maîtrise de l'information sera conditionnée par le choix du modèle de formation et par l'environnement culturel dans lequel on opère.

Ainsi, selon que l'on s'intéresse à l'ingénieur-technicien, à l'ingénieur-scientifique, ou à l'ingénieur-manager, les objectifs, les programmes et les pédagogies des formations à l'information différeront assez sensiblement.

C'est la raison pour laquelle il est important que chacun, dans son contexte, puisse trouver la voie la plus appropriée (7).

Cette remarque préalable étant faite, on peut donner quelques règles générales et formuler quelques propositions acceptables dans et par un grand nombre d'établissements.

Des actions de formation avec différents niveaux d'implication

Le minimum qu'il serait logique de trouver dans toutes les universités techniques et autres écoles d'ingénieurs est celui d'une sensibilisation générale aux méthodologies de l'information et de la documentation. Cette initiation touchant tous les étudiants devrait à priori être faite dans les premières années de formation et devrait permettre aux étudiants de pouvoir utiliser au mieux les ressources informationnelles et documentaires à leur disposition à l'université ou dans les entreprises.

Un second niveau relèverait d'une approche déjà plus spécifique du travail de l'ingénieur. Il s'agirait principalement d'introduire des modules de formation s'adressant à des étudiants en fin de scolarité et conduisant à développer des apprentissages relatifs à la maîtrise stratégique de l'information, en tant que composante du travail quotidien de l'ingénieur.

Enfin, un troisième type d'action de formation concernerait ceux des étudiants et des ingénieurs qui pourraient inscrire cette compétence particulière dans la panoplie de leur spécialité. En d'autres termes, former par des options ou cycles particuliers, des spécialistes de la maîtrise stratégique de l'information ayant la double compétence «ingénieur» et «spécialiste de l'information». On pourrait ainsi imaginer former des ingénieurs spécialistes de la veille technologique.

Des lieux multiples pour la formation à l'information

Une autre façon d'aborder la question de la formation à l'information est de considérer tous les «lieux pédagogiques» où cette formation peut être envisagée.

Il y a bien sûr ce lieu privilégié qu'est la formation initiale des ingénieurs. Mais il existe d'autres lieux qu'il ne faut pas négliger:
- la formation par la recherche et les formations doctorales constituent un terrain privilégié pour l'introduction de modules de formation à la maîtrise de l'information;
- la formation continue des ingénieurs est également un cadre intéressant pour développer des expériences originales: apprendre par exemple à des ingénieurs en activité comment prendre des brevets, comment défendre et protéger ses idées, comment se prémunir contre les espions. La veille technologique serait notamment un thème privilégié pour des actions de formation continue destinées à des ingénieurs de 35 à 40 ans.

Des contenus de formation attractifs

Il faut tout de suite affirmer qu'en aucune façon il ne s'agit de former des documentalistes, pas plus qu'il ne s'agit d'apprendre aux ingénieurs les subtilités et les fondements des règles de catalogage des documents écrits.

Les échecs souvent constatés dans les expériences de formation des ingénieurs à la documentation tiennent à une confusion d'objectifs; la formation spécifique des ingénieurs à la formation ne saurait être en aucune façon une formation centrée sur les «recettes professionnelles» des documentalistes et conservateurs de bibliothèques.

Cette formation spécifique devrait plutôt renvoyer à des contenus ou interrogations tels que les suivants:
- comment définir et formuler ses propres besoins en information ou ceux de son entreprise?
- comment estimer le coût d'un processus de maîtrise de l'information et comment décider en conséquence du meilleur choix de solution ou d'investissement?
- comment accéder à l'information, à travers des sources multiples?
- comment trier l'information, comment évaluer la documentation recueillie, comment établir des synthèses?
- comment gérer l'information produite ou collectée?
- comment stimuler la production d'informations pertinentes à l'intérieur de l'entreprise?
- comment valoriser des savoirs et des savoir-faire, comment breveter, comment normaliser, comment diffuser?
- comment observer l'environnement, comment exploiter bases et banques de données dans une perspective de veille technologique?
- comment intégrer l'information et la documentation aux processus de conception (CAO, Analyse de la Valeur ...)?
- comment constituer, au sein de l'entreprise, des systèmes fonctionnels de maîtrise stratégique de l'information spécialisée?

Cette liste de question ne prétend pas épuiser le sujet. Il va de soi que chaque établissement de formation peut tout à fait définir des contenus plus spécifiques (8).

Des modalités pédagogiques efficaces.

Si la visite de la bibliothèque centrale ou du centre de documentation reste la pédagogie la plus largement répandue, elle ne saurait constituer la colonne vertébrale pédagogique de ces formations à la maîtrise de l'information. Il faut beaucoup plus. Il faut impérativement que ces formations – initiation comme approfondissement ou spécialisation – soient explicitement intégrées dans le cursus de formation des ingénieurs. Des cours doivent être proposés aux étudiants, des seminaires doivent être organisés. Des travaux personnels sont à prévoir, de même que des projets collectifs sont à imaginer. Enfin, l'intégration doit être telle que les thèses ou mémoires personnels de fin d'étude des étudiants futurs ingénieurs doivent impérativement comprendre une composante «maîtrise de l'information» relative au sujet traité.

3. Penser l'information et l'ingénieur de demain

Mais prenons un peu plus de recul et reformulons le problème dans les termes suivants: comment l'information va-t-elle transformer les conditions de travail de l'ingénieur de demain? Ou encore vers quel profil d'ingénieur doit-on aller?

Ainsi reformulée, la question de la formation des ingénieurs à la maîtrise stratégique de l'information (MSI) renvoie à la question même de la formation de l'ingénieur de demain.

Sans faire de prospective exagérée, on peut affirmer que l'ingénieur du XXIè siècle se démarquera profondément de l'ingénieur du XXè siècle par le fait que son métier sera de plus en plus influencé par le poids intrinsèque de l'information dans les produits et services pensés et offerts par l'ingénieur. De même, cet ingénieur du XXIè siècle sera de plus en plus confronté à des démarches nouvelles de mobilisation de la connaissance, élargissant toujours plus l'univers des possibles, et requièrant des méthodes de compréhension d'une réalité de plus en plus complexe, polysémique, systémique.

Les formations à la maîtrise stratégique de l'information pour les ingénieurs doivent donc impérativement anticiper (peut-être plus modestement rattraper) certaines évolutions. Citons en quelques unes:

La *démarche qualité* est aujourd'hui largement ancrée dans les pratiques des entreprises performantes. Or cette démarche qualité, a bien y regarder, n'est ni plus ni moins, qu'un processus de maîtrise de l'information. Le contrôle de qualité, les cercles de qualité, la qualité globale, l'assurance qualité, la fiabilité, la sécurité de fonctionnement, tout cela requiert une parfaite mobilisation et un traitement efficace de l'information. La confrontation d'informations en provenance de différents secteurs de l'entreprise, l'analyse statistique des données, l'expression des salariés, l'analyse de la valeur et le cahier des charges fonctionnel, autant de pièces du puzzle information spécialisée à relier au concept de qualité.

Les *méthodologies de travail* et plus particulièrement les méthodologies dites de «problem solving» et d'analyse de système sont désormais amplement utilisées par les entreprises compétitives. Des méthodes telles que l'analyse de la valeur ou les techniques de créativité ont fait leur preuve et témoignent de l'intérèt porté au travail de groupe, à la formation fonctionelle des besoins, ou encore à la notion de plan de travail pour la résolution de problème (9). Toutes ces méthodes ont un point en commun: l'indispensable maîtrise de l'information. L'efficacité d'un groupe vient de son aptitude à mobiliser, à traiter et à reformuler l'information disponible. Il y a un lien essentiel entre méthodologie d'une part, et information d'autre part (10). C'est ce lien que les ingénieurs n'ont pas encore complètement découvert et que des formations à la maîtrise stratégique de l'information doivent révéler.

La problématique de *l'ingénierie de la connaissance* constitue une troisième composante d'évolution. Intelligence artificielle et systèmes experts sont désormais des mots clés obligés du travail de l'ingénieur. Plus généralement, que l'on s'intéresse à la productique ou que l'on cherche à gérer des réseaux télématiques ou des réseaux d'assainissement, il est clair que la machine-ordinateur a avantageusement remplacé l'ingénieur, calculateur besogneux. Mais, derrière ou en amont de la machine, il faut la connaissance, le savoir, il faut des bases ou banques de faits et de lois. On remonte donc aujourd'hui à l'essentiel. Dans cette perspective, la formation à la maîtrise stratégique de l'information s'articule parfaitement avec une nouvelle ingénierie de la connaissance.

La mondialisation de l'économie, l'ouverture des frontières, la circulation des hommes et des biens introduisent une nouvelle donnée à prendre en compte dans toute prospective de la formation des ingénieurs: *la multiplicité et la rencontre des cultures*. Si depuis plusieurs années dejà, les responsables de formations d'ingénieurs ont imposé l'apprentissage des langues étrangères à leurs étudiants, il faut constater qu'aujourd'hui la connaissance de données de marketing international devient une nécessité. De même, la conception, la réalisation, la

commercialisation des divers produits industriels impliquent des acteurs répartis sur toute la planète et imposent donc à l'ingénieur de savoir travailler avec des partenaires d'origines, de cultures et de langues différentes. La maîtrise stratégique de l'information, c'est aussi cette réalité de la confrontation des cultures.

4. Quel rôle pour les spécialistes de l'information

Si, dans une Université Technique, ou dans une Grande Ecole d'Ingénieurs on imagine aisément le rôle que peuvent jouer des enseignants de mathématiques, de mécanique, d'urbanisme ou de biotechnologies, il n'est pas aussi simple de déterminer qui doit intervenir au niveau de la formation à la maîtrise stratégique de l'information.

Doit-on disposer d'enseignants (chercheurs) specialistes de ce domaine (mais existent-ils?), doit-on recourir à des enseignants des disciplines traditionnelles en leur demandant d'intégrer cette composante MSI à leur enseignement, ou doit-on faire appel aux techniciens de la documentation, aux documentalistes ou autres conservateurs de bibliothèques?

Il va de soi que l'idéal serait de disposer d'équipes enseignantes pluri-disciplinaires dans lesquelles interviendraient les divers spécialistes mentionnées plus haut: des théoriciens et des praticiens, des spécialistes de l'information et des experts de domaines techniques particuliers.

D'une façon générale, il ne paraît pas anormal que les personnels d'encadrement des bibliothèques ou centres documentaires des universités techniques interviennent activement dans les programmes de formation à la maîtrise de l'information et qu'ils en soient même les pilotes ou responsables.

Plusieurs conditions doivent néanmoins être respectées:
– d'abord existence de moyens techniques et en personnels suffisants et surtout performants;
– éventuellement création à l'intérieur de (ou en parallèle à) la bibliothèque de l'Université, d'une chaire ou d'une entité responsable du programme MSI;
– intégration dans une équipe enseignante MSI de personnes venant d'autres secteurs de l'université et surtout de spécialistes extérieurs à l'Université;
– impérativement, démarquage des programmes de formation à la MSI des traditionnelles sensibilisations aux fichiers documentaires et des visites à la bibliothèque de l'Université Technique;
– enfin et surtout, adoption d'un état d'esprit plus «ingénieur» que «documentaliste» pour une meilleure compréhension des besoins spécifiques des ingénieurs.

Sous réserve que ces conditions soient respectées, il peut s'avérer tout à fait judicieux que les spécialistes de l'information, cadres de la bibliothèque de l'Université Technique développent de nouvelles aptitudes professionnelles orientées vers la maîtrise stratégique de l'information, qu'ils conduisent des recherches dans ce domaine ou interviennent comme consultants auprès d'entreprises ou d'ingénieurs et qu'enfin ils contribuent pleinement à la formation des nouveaux ingénieurs.

Peu d'experiences convaincantes ont été menées à ce jour, poussant le plus loin possible cette logique de la maîtrise stratégique de l'information. Mais, il est fort probable que la décennie 1990–2000 sera déterminante en la matière et que des initiatives seront prises prochainement dans les cursus de formation des ingénieurs.

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Information Skills across the Curriculum

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Abstract

There have been many changes in the way that we think about the library and librarian in the school of today. Because school libraries and librarianship have been so neglected and badly funded, it has been essential to think very hard about their relevance to teaching and learning, about their unique contributions to the development of young people's knowledge and skills, and about the way in which teachers want, need and use information during their daily work. I believe that some of the developments in the UK are worthy of a wider audience because they demonstrate the use of effective strategies and clear, sharp thinking about what information resources and services teachers and their students really need.

This paper is in three parts. Firstly, an outline of the problem addressed by the community of professionals involved in school librarianship. Secondly, some details of the strategies used to reach the goals we determined. Finally, some examples of the results of our efforts which will affect all the work undertaken in further, higher and adult education and training. Put simply, I believe that current activities in schools are not only harnessing the power of information technology to develop sophisticated information-handling skills among a much younger age group but also de-skilling librarians. Their expertise can now be shared among clients. More important, the use of information technology to gain access to world information services and systems diminishes the need for access to a library or librarian. Perhaps the students and workers of tomorrow, for whom many of your services exist, will arrive in your institutions already "information skilled".

Problems in schools

Three main problems have been addressed by teachers and librarians in recent years:

1. There are relatively few schools with professional librarians in most countries of the world. Where they exist, they are usually working without library assistants and without the back-up of inter-library networks. A librarian will be responsible for library provision for perhaps 1000 children and 100 teachers. Ways must be found of making them more efficient, for they are unable to devote much time to user training and preparation when there are so many tasks to accomplish and only one person available. In schools without librarians, the majority in fact, these tasks must be undertaken by a teacher in whatever spare time is available after teaching duties.

2. The time within which material must be provided to support curricular needs is generally very short, for school projects are set for weeks rather than months. Modern pedagogy makes learning more relevant to children's experience, with science teaching based on practical projects, and history teaching based upon the application of historical methods to local documents and artefacts, rather than on the memorising of theories and facts.

3. The modern curriculum requires access to information about current topics: acid rain, the greenhouse effect, oil pollution, biotechnology and comparative world religions are

among many topics studied by children today. The book publishing industry cannot respond quickly enough and teachers need access to a wide range of topical material including newspapers and scientific journals.

These problems – time and available expertise, enquiry-based learning and teaching, the need for highly current information – resulted in new thinking about libraries and librarians. The questions that arose were, for example,

What information resources are essential?
Where can they be obtained?
What information-handling skills are essential?
Who should develop them?
How can they be practised?
What materials and tools might help?

Over a period of about ten years, the British Library Research and Development Department funded numerous small projects to investigate these problems (1). There is now a significant body of knowledge and, even more exciting, a substantial amount of activity in schools with a very high level of interest among teachers in all aspects of information handling and use. The ball is rolling!

Strategies to promote information skills across the curriculum

The reports of school examination boards provide a clue to the skills required for successful study. Often, the reports mention the fact that students copy material from books without synthesis in Chemistry, or that they are unable to interpret photographs in Biology, or choose too broad a topic in Geography, or find graphs difficult to interpret in General Science. All of these skills are information-handling skills. The analysis of examiners' reports therefore provides plenty of material to guide anyone trying to foster the use of information resources. The points refer, however, not to the knowledge and use of specific information sources but to the skill required to make use of the information they contain.

Policy documents from government also provide clues. Educational reports point to skill needs and deficiencies but more important sources of inspiration are the documents from industry and their relevant government offices. These suggest manpower needs and skills, and allow educators to examine their curricula for relevance and preparation. A report on IT skills shortages suggested a need in industry for graduates with a whole range of communication and information skills as well as a knowledge of electronics. Few school teachers see such reports but they provide better arguments for improving the development of information skills than anything produced by educators themselves.

Most school systems include teams of inspectors who inspect resources and teaching regularly and advise and guide both government policy and school practice. In the UK, they meet in inter-disciplinary teams, so reaching any one is potential access to all. They hold staff training courses, and making presentations at these is a way of alerting them to the issues and to tactics for addressing them. The message about information skills, and the resource collections required to foster them was therefore quickly moved around the inspectorate, in all subject areas. This led to gentle influence on both policy and school practice as the inspectors moved around schools and areas in the UK.

Industry in all countries must concern itself with efficiency and profitability. It is easy to show how access to information and good use of it can make working more efficient. It is less easy, but not impossible, to show how the development of such skills at school can yield a better potential workforce at all levels – not just for those who continue their education to

graduate level. Securing the support of industry is crucial, for it is to industry that government must look for new horizons and income, through industry taxes, an earning economy, and an employed population. In the UK it was found that the support of several industrialists helped to add fuel to the debate so that the message was then reaching different government departments at the same time. If a message is heard in several places, it stands a better chance of being heard!

Finally, the teachers. Analysis of their curriculum plans, and a capacity to read between the lines, enables the inherent information skills to be detected. There is a need to analyse curriculum statements such as "Children should understand pollution control" to identify the cognitive processes involved in gaining and demonstrating that understanding. In this example, children would need to practically investigate pollution by local experiments, read about pollution control, synthesise and organise their findings and feelings, and then communicate these either orally or in writing. Only one part of this process might involve using a library, but it is impossible to consider this out of the total context of the assignment set by the teacher in order to achieve that understanding of pollution control.

The study of school assignments – the tasks set by teachers to achieve curricular objectives – is essential. If we do not know what task was set and what objectives are to be achieved, how can we adequately supply information to the student? Unfortunately, this is how many librarians function, and where much user education starts. Our task in the UK was to see what information was needed, when, where, and in which form. And then to try to deal only in the skills needed at that time. The term "library user education" was altered to "information user education". The difference is subtle, but it is important and changes the way we operate with teachers and students. It also, eventually, changes the way we provide information services, but more of that later.

Much teaching is subject-based. Few teachers see learning as a process. We have tried to uncover the processes involved in learning subjects and to reflect these. We have encouraged teachers to compare and contrast the process skills within their schools, to help identify which are common to all subjects and which are truly subject specific. As time goes by, everyone realises that few skills are unique to a particular subject. Interpreting graphs in geography is the same as interpreting graphs in mathematics. Evaluating evidence in history is the same as evaluating evidence in social studies.

Information technology makes this clearer. The use of computers in schools is well established, thanks to the initiatives of three different government departments, the IT industries, and the small core of enthusiasts who took the first steps in schools. Initially, most uses were of subject specific software but now there is widespread use of "generic" or "content free" software which facilitates the handling of data and information in any subject. The database package used in history is equally at home in the physics or geography classroom, for what it does is what humans do – it enables information to be processed, manipulated and presented in a variety of different ways and forms.

As information technology permeates the school curriculum, information skills development becomes a more prominent issue among teachers. Now, the new national curriculum gives equal weight to knowledge (subjects) and skills (learning processes), and the skills for learning are information skills. The curriculum aims and statements include those associated with handling information in all media. For the young scientist, there is an expressed need to make contact with the ideas of many scientists through secondary sources, and to learn different ways of presenting information about science to a variety of audiences. Some of these aims will require access to a library, but it may be that the best resource is a library serving scientists rather than schoolchildren. One of the outcomes of information skills acquisition by children, and of the curriculum demand for topical information, is that children at school

can make use of material aimed at other, older, often specialised audiences. Clearly, by the time they reach college or university, they will be familiar with some of the sources and services offered to older students and workers.

Wider horizons: some examples of current practice
Some schools in the UK and USA have begun to use online information services created for scientists and other professional workers and academics. The IT available in schools is cheap and simple by comparison, but its capabilities for online use are identical. In one British Library sponsored project, children aged from 8 to 18 years old have been learning to choose files and interrogate them for their school assignments (2).

The younger children were engaged in a workshop which involved them making decisions about survival and escape from a jungle. They had to investigate hazards on their chosen route – involving one boy in finding out how to treat snake bites – and work out how to cross rivers, how to deal with the climate, and how to negotiate with and manage a team. These children used some of the full-text databases available on DIALOG and PROFILE such as Everyman's Encyclopaedia and the national newspapers.

A group of 17–18 year old students investigated the French general election in 1988, using DATASTAR's Swiss news agency file to gain access to material that was both topical and in French. Two science students investigated aspects of physics, retrieving research papers, one on the acoustic properties of a wine glass. Other science students investigated biotechnology issues. History students examined Historical Abstracts for papers on Custer's last stand and the characteristics of General Custer's personality. In Religious Education, Religion Index and the UKMARC file on BLAISE yielded useful references on aspects of the creation story that could be contrasted with scientific views on the origins of mankind.

In all of these examples, the children were able to explore topical interests and concerns irrespective of the presence of a good library collection in their schools. The online services and systems were therefore widening the classroom horizons and enabling the teachers to be both more responsive to the children's interests and more adventurous in their choice of topics and teaching styles.

Some implications for librarians
The initial school problems of time, topicality and speed seem to be partly addressed by the use of IT systems to gain access to knowledge across the world. Most of our schools do not contain long runs of specialist periodicals, nor do they contain their abstracts and indexes. For schools using online services, access to such a wide range of information provides the essential resource to support the curriculum and acts as an opportunity to develop and practice information skills. Children learn to ask real questions and to phrase them in appropriate ways; they learn to sift from a mass of information; they learn to reject what is not relevant, and to evaluate the quality of what is judged relevant to their topic; and they learn how to focus their attention on what information is required for the task and how it should be integrated in any reporting or essay writing.

These processes are fostered by teachers, who can guide the learning by being present during the searching. Some of the schools have access from their classrooms whilst others travel to the school library where traditional resources can be used at the same time. They are naturally supported by librarians (where one exists) but since this is the exception rather than the rule in UK schools, it is important to help teachers develop information concepts and skills. All schools have teachers. Only a fraction have librarians (in the UK there are about 800 librarians in 8000 secondary schools and less than 10 in 20,000 primary schools).

The fact that all children attend school, and this lasts for a minimum of 11 years, makes

this sector of education very important. If librarianship is to make an impact on the whole population, the children in schools are a captive and responsive audience, and one day, they will be in positions of importance in all aspects of our society and government. We have had to encourage the development of information skills by working with and through teachers. This has been so successful that information skills are now documented alongside the requirements for subject knowledge in the UK national curriculum.

The pervasive impact of IT in schools has helped to make clients for IT based information products in a previously ignored but substantial market sector, and as these children grow up and move into work or higher education, they will surely expect to continue their access to information and knowledge, wherever, however, it is held. With access possible from a desk top, how will they react to librarians who restrict this in their libraries? Or who restrict access to other forms of knowledge to certain times of day, or days of the week? Many of our rules and procedures are now inappropriate for people who have learned that information is accessible at any time, from any place, on any topic. And the ultimate benefit of IT based services is that they make the task of finding exactly what is wanted so very much easier. Our children are experiencing such systems now, and they have a vision of what is possible that may lead them to new information pastures. The big question that remains is, will we be grazing in those new pastures?

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Development of Hospital Libraries in Sweden

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Abstract
Sweden has developed a special library form, i.e. the integrated hospital library, which provides both medical and general library service. With a few exceptions in Denmark, Norway and Great Britain, this kind of library is unique to Sweden. The author finds it surprising that other countries have not discovered this excellent library form and what potential it offers for regional collaboration, providing the advantages of both the specialized and the general library.

Swedish public libraries are well developed and compare favourably with public library systems throughout the world, perhaps not as real innovators but in administering and developing ideas that originated elsewhere. In some areas, however, Swedish public libraries have ploughed their own furrow. One of these is in the hospital library sphere where in Sweden a very special type of library has been produced – the integrated hospital library – that with a few exceptions in Denmark, Norway and Great Britain exists nowhere else in the world. The integrated hospital library, is a library that has both a medical and a general department, and that consequently functions as both a medical library and a patients' and staff library. It is surprising that more countries have not discovered the value of these libraries and what potential they offer for regional collaboration, providing the advantages of both the specialized library and general library provision.

In Sweden, the route to these integrated hospital libraries has been via patients' libraries, which developed unusually early and effectively, while specialized medical libraries developed remarkably late. These circumstances are quite unique to Sweden. In the world at large the reverse is the case.

The public-library inspired hospital library dates back to the 1920's, when the first patients' libraries were created through voluntary efforts. In 1921 there were 7 patients' libraries in Sweden with loans totalling 1,272 volumes. In the 1930's the organizational form arose, where public libraries would handle the work. This new form of collaboration between hospital and public libraries became common practice for general libraries (combined staff and patients' libraries). Today nearly all hospital libraries in Sweden are branches of public libraries.

Nowadays hospital libraries are financed almost entirely by the county councils – the responsible authorities for health care in Sweden. These councils usually commission the local authorities to run the hospital libraries.

During the 1950's and 1960's the activities of both public libraries and patients' libraries increased markedly. This upswing stems mainly from the competence and skill of the professionally trained librarians who handle the running of these libraries as well of course as the healthy economic climate of the time.

During this period libraries with a solely medical function were not so well developed.

A government inquiry carried out in the 1970's showed that most of the hospitals and nursing homes in Sweden had patients' libraries (80%) while just over a third (36%) had specialized medical libraries at their disposal. The majority of these specialized libraries were not

part of the public library system and were not run by trained librarians. Neither were most of them actual medical libraries, but rather unorganized collections of medical literature spread out among clinics and departments. Only a few medical libraries were in fact true medical libraries, run by qualified librarians.

The information explosion of the 1960's caused doctors and other hospital staff to call for a qualified professional library service. It then seemed natural for county council and hospital administrators to commission the professionally trained librarians who had been handling the patients' libraries so successfully, to shoulder the responsibility for running the specialized libraries. Thus we acquired many integrated hospital libraries in Sweden, that proved to be rational, efficient and economical. Integrated hospital libraries in Sweden are still growing, while there have never been more than ten or so purely medical specialized libraries in hospitals run by trained librarians.

The first integrated hospital library in Sweden was that in Falun, where the hospital librarian, Ulla Kjerrström, served indefatigably as a pinoeer of this new organizational form from the mid-1950's until the mid-1970's.

Over the past twenty years various surveys have dealt with the hospital library function in Sweden. Some have had great significance for the development of hospital libraries in our country and as a rule have dealt mainly or solely with general library activities in hospitals. They all share the same view on the goal of general hospital libraries and their organization.

1969 saw the National Board of Education's "Guidelines for Library Activities at Long-Stay Intitutions". These guidelines came to have exceptional importance for the development of Swedish hospital libraries, along with the standards relating to size and dimensions of hospital library premises, published the same year by SPRI (the Swedish Planning and Rationalization Institute or the Health and Social Services).

The reports issued by Spri at the end of the 70's and beginning of the 80's have also influenced the activities of the country's hospital libraries, one of them referring only to library premises for children's library activities. These reports have been very influential for the development of the physical library environment for both the medical and the general library activities of integrated hospital libraries, patients' libraries, and genuine medical libraries.

Later surveys have all been much influenced by the National Council for Cultural Affairs' study entitled "Hospital Libraries", that in 1976 proposed generous guidelines for the activities at and organization of the general hospital libraries in the country. "Hospital Libraries" does not discuss specialized medical library activity in detail, but offers views on its organization and recommends co-ordination between specialized and general libraries. "Hospital Libraries" also suggest that the county councils test the feasibility of setting up regional medical libraries to serve whole council areas – the organizational form intitiated in Karlstad in 1970.

The Federation of County Councils' study "The County Councils' Libraries, Specialized Medical Libraries and School for Nursing Professions' Libraries" is the only one that reviews the activities and organization of the specialized medical libraries. This study also recommends integrated hospital libraries and regional medical libraries.

A leading idea in the National Council for Cultural Affairs' study "Culture in the Care Sector" is that anyone admitted to a long-stay care institution has as much right as anyone else to partake of society's cultural facilities, and that all of society's cultural expressions shall, to the greatest possible extent, be made accessible within the institutions. The hospital environment should not only be satisfactory from a medical point of view, but it should also be intellectually and emotionally stimulating. This is especially important in long-stay institutions. The hospital library's central place in the cultural activities provided in the medical care sector is emphasized, plus the fact that a well-functioning library service is necessary in order

to reach a satisfactory cultural level – for both patients and personnel. Ever since the 1920's the Swedish hospital libraries have also served as staff libraries for all employees. It is evident that this positive view of the hospital libraries' activities pervades the various studies which have influenced the development of hospital libraries in Sweden during the course of the last three decades. This has meant that Swedish hospital libraries have developed into libraries where all categories of health care workers as well as patients are welcome and this has had positive effects for medical library activities as a whole. The integrated hospital libraries have striven to make themselves available to all personnel categories, not just physicians, though that is of course a very important target group for medical library activities. Patients and patients' families are also welcome to consult the more accessible literature in the medical part of the integrated libraries.

Today Swedish hospital libraries are flourishing, their broad activity field ranging from story-times for children to computer-based literature searches. The medical library sector functioned so responsively that in 1989 it accounted for 26% of the total Swedish usage of the Medlars databases at MIC, Karolinska Institute Library and Information Center, compared with the pharmaceutical industry, 22%, and the university libraries, 16%, (Measured in SEK). Thus in 1988 the hospital libraries were the biggest user group of Medlars-at-MIC. At present over half of the 250 largest hospital libraries in Sweden are integrated while regional medical library activities exist in 6 or 7 counties only.

There are still no more than about ten genuine medical libraries, run by trained librarians. Hospitals with neither an integrated nor a purely medical library do not have access to a professionally run library, but only organized book collections in clinics and departments.

In counties that have integrated hospital libraries and a regional medical library administration, the hospital library service is usually of a very high standard.

For example: all the libraries at the 22 hospitals and nursing homes in the county of Värmland are integrated hospital libraries with both general and medical stock and services. As regards the general library activities all the libraries offer the same services to patients and staff – weekly book trolley rounds, book-lending services, talking books, music tapes, tape recorders, programmes, exhibitions, etc. At 17 of the libraries there is also an art collection activity that up to now aims mainly at the long-stay patients. All hospitals and nursing homes have specially employed readers who read to individuals or small groups of long-stay patients. The regional hospital library in Karlstad also has special reading hours for children and children's art collection. Thanks to the central hospital's library serving as the regional medical library for the whole county council area, the libraries can also offer an excellent specialized medical library service. Värmland County Council is the principal for the hospital library activities within the county. The regional hospital library in Karlstad is run directly by the county council while all other hospital libraries in the county are run by the local authorities on behalf of the county council.

The primary objective of hospital medical library activities in the county of Värmland is to provide – through the libraries of the hospitals and nursing homes in the county – all health services employees with access to the professional literature they require, for their jobs, their own professional development and research in connection with the activities of the county health services. Patients' needs for medical literature should also be respected. The library of Karlstad Central Hospital is a resource center for the whole county (population: c. 250,000) and as such it provides support – as far as time and facilities allow – in the form of book loans and literature searches, to other libraries in the county, e.g. municipal libraries, university and college libraries, company libraries; as well as individual students, organizations for the handicapped, etc.

In general, this objective has been fulfilled: via the libraries of the hospitals and nursing

homes, the county has maintained a uniform level of medical library service to health care workers throughout the county. The media resources have proved sufficient to provide all health care workers in the county with access to the medical literature they require, to carry out their work and any research activities in connection with the county health services they may undertake.

The library of the Karlstad Central Hospital is responsible for the acquisition, registration and distribution of medical and other literature pertaining to the field of health care and for literature searching, loans, information, contact with patrons, providing advice and support to all personnel categories and libraries connected with in-patient and out-patient care. The library of Karlstad Central Hospital has gradually acquired a pivotal role within the country, through its medical department. The library staff tries to help other libraries, where possible, and individual students, etc., with loans and literature searches.

Besides the central hospital, there are four smaller county hospitals as well as some 15 nursing homes. The integrated hospital libraries at these 21 hospitals are responsible for any supplementary maintenance of the local medical libraries that may be required. This includes registering and distributing new books and periodicals, etc., within the hospital or nursing home; furthering suggestions for acquisitions and loans; passing on search queries to the Karlstad hospital library. At two of these smaller county hospitals, the libraries perform their own data searches on their own terminal.

All personnel categories in out-patient services – district physicians, district nurses, staff of children's medical centers and maternity care centers, and other out-patient units can either contact the hospital library in Karlstad directly, or go through their nearest hospital or nursing home library, for help in finding information. For these personnel categories, every out-patient unit has its own collection of relevant reference literature and periodicals. The hospital library in Karlstad also organizes an extensive program of circulation of medical journals to personnel in the out-patient services.

Centralization of book acquisitions and journal subscriptions has resulted in more rational organization. For instance, the implementation of a central catalogue has meant that stocks of books and journals are used more effectively. Where loans and literature searching are concerned, the Karlstad hospital library has accumulated the expertise that can enable it to provide, in co-operation with other, smaller hospital libraries in the country, effective and fast service to borrowers in the health and medical services of the county.

It is very likely that within the next few years the administrative routines of the library will become computerized, as is the case at several other Swedish hospital libraries. This will undoubtedly result in further gains in effectivity, and improved library service.

During the current year the county council in the county of Värmland is investing 5 million SEK in general library work and 3 million in the medical library activities in the county council area – this, in a county with 280,000 inhabitants and barely 4,000 beds.

Hospital libraries in the county of Värmland are in many ways typical of Swedish hospital libraries and all the activities and services that are offered exist in many other Swedish hospital libraries. The picture, however, is not as bright in all counties.

As in most countries, during the past decade all types of libraries in Sweden have suffered severe reductions in their activities and media purchases. Hospital libraries have done well, however. This can be ascribed to the fact that they have managed to fulfil the library and literature needs of patients and personnel alike within the Swedish medical care sector rationally and economically. Swedish hospital libraries – not least the integrated ones – anticipate being able to broaden and develop their activities in the future.

Automation at Landspitalinn Medical Library

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Abstract

Landspitalinn Medical Library and other libraries in Reykjavik tested four different library automation systems. The system that was chosen by the testing group was IBM's Dortmund and Leuven Library system known as DOBIS/LIBIS. The selection was based on the following: 1) All library functions had been developed and tested; 2) The system is organised as a network; 3) The system has the ability to handle a great number of volumes; 4) It works with one set of data all available online; 5) It is improved on a regular basis based on users' suggestions; 6) It is used in many libraries in the world; 7) It runs on hardware which is available in Iceland. From the testing group two libraries are now using DOBIS/LIBIS – The Reykjavik City Library and the Landspitalinn Medical Library. These two different types of libraries share the same bibliographic data with few difficulties although the libraries have to agree on rules for how to input data into the system. Landspitalinn Medical Library began to use this year. The library has so far successfully used the cataloging facility. The plan is to make full use of the system by the middle of next year.

Since the beginning of 1990, Landspitalinn Medical Library has been using the IBM Dortmund and Leuven library system known as DOBIS/LIBIS. The system is operated by the Icelandic State and Municipal Data Processing Centre (SKYRR). It is used jointly by Landspitalinn and the Reykjavik city library, Borgarbokasafnid. Landspitalinn is the National Hospital of Iceland. The Landspitalinn library serves both the hospital and the health science students from the University of Iceland. It is a small library by international standards. The library subscribes to 666 journals and includes a book collection of 6,000 titles. The staff consists of six librarians and two library assistants. One might wonder how we have managed to obtain such an automatic system for such a small library.

At the present time, in all of Iceland there are about 200 public libraries and over 40 research and other special libraries. Since there is no statutory national library system, cooperation between libraries is voluntary, and depends upon the individual libraries' interest. In 1980, there was intense interest among the librarians to automate their libraries and select a common computer system. In 1981, a committee – "Tölvunefnd bokasfna" – was formed to look into the matter. The committee produced a proposal to select a system to be used for one integrated bibliographic database that could be shared by different types of libraries and that would meet all their different needs. The proposal stipulated that the database be accessible from any location in Iceland and that the system would be able to handle all library functions. This proposal was realistic considering that the size of the collection of each of the libraries in question is rather small. Libraries in Iceland are smaller and fewer than in most countries. The population of the country is only 245,000 and half of the people live in the capital city, Reykjavik. The production of books in Iceland during the last 100 years amounts to some 40,000 titles. The proposal also contained other requirements for the operation of the system.

Systems were selected for testing by librarians from different libraries. Four systems were

tested and one of them was DOBIS/LIBIS. The system was set up to be tested in May 1986 at SKYRR. SKYRR runs a number of computerized databases that are searchable online from all parts of Iceland, e.g. the Icelandic Lawbook and the National Register. Five different libraries took part in the test. Among them were the University Library, the National Library, the City Library of Reykjavik and Landspitalinn, the National Hospital Library.

A majority of the testing group chose DOBIS/LIBIS over the other systems. DOBIS/-LIBIS met most of the requirements set up by the committee and in several aspects it was clearly superior: 1) All library functions had been developed and tested; 2) DOBIS/LIBIS is created as a network and can be used by many different libraries without their interfering with one another. Each library in the system has its own circulation, funds, etc. Even a branch library within a system library could have its functions separate; 3) The system can handle a great number of volumes; 4) It works with one set of data which are all available online; 5) It is improved on a regular basis based on users' suggestions. There is a large user group which meets once a year. Each library also has the right to change the system to fit its needs; 6) The system is also used by many libraries throughout the world, for instance, large libraries such as Oxford and Liverpool University Libraries in the U.K.; 7) It is run on hardware which is available in Iceland.

Although the majority of the committee had chosen DOBIS/LIBIS, all the libraries were not ready to make a decision to choose the system. The first one to choose the system was the City Library, Borgarbokasafnid. In 1989, the city of Reykjavik bought the system. SKYRR maintained it, as it had done for the test. The DOBIS/LIBIS system is run on an IBM 4381 computer which is going to be replaced this summer with an IBM 3090-200 J computer. The operative system used is MVS. The data processing staff consists of three computer scientists – one from IBM and two from SKYRR. The new "Version 2.1.1" of DOBIS/LIBIS was installed in January 1990. Such revised versions appear at regular intervals. In 1989, the Landspitalinn Library joined the City Library as a user of the DOBIS/LIBIS system.

General features of DOBIS/LIBIS
Although this presentation is intended to describe the system in operation at the Landspitalinn Medical Library, som description of the system itself is necessary.

DOBIS/LIBIS is an integrated librarys system, which means that all functions of the system – searching, public access, acquisitions, cataloging, circulation, periodicals control and abstracts – work with one set of data all available online. Data is entered only once and stored in authority files for later use in creating the catalog, acquisition, circulation and periodicals records. These records are re-used when additional copies of a document are needed. This eliminates duplications. Both library staff and users can access information through the indexes. DOBIS/LIBIS is multi-lingual and MARC -compatible. It is suitable for many types of library environments. It can be used in a single library or in a network of libraries.

DOBIS/LIBIS consists of a set of programs that together cover all library functions, i.e.:
1. Online searching and public access
2. Online cataloging and developing abstracts
3. Online circulation
4. Online acquisition
5. Online periodical control
6. Catalog and report production
7. Production of management statistics
8. Online mail

1. Online searching and public access

System menus

The user selects an item from a display menu. There are many options to choose from. Each function in the system has its own menu. If the user is in the process of searching for example, he can choose name, title, subject, ISBN number or publisher. After he has indicated his choice, by using the numbers on the menu, e.g. a subject, the system responds with an empty field for the user to type in the subject. The system then responds with an alphabetical index where the user again selects the subject.

Command chains

The command chains are designed for the experienced user. The user can go through as many menu/function levels as required without having to view the intermediate screens. These command chains can also be used to move from one function of the system to another, e.g. from circulation to periodicals. The user types in "//peri" and enters the periodical function.

The program has Boolean search operatos, KWIC indexes, truncated searching and quick-searching. The system also has a special online public access catalogue, LIBIS (OPAC). The library user can search with words from personal and corporate names, titles, subjects, abstracts, publishers and ISSN or ISBN numbers. He can also use Boolean operations and limitation of search results, by date, type of material, location and circulation status. He can browse through the records and search using truncated search terms. He may browse freely backwards and forwards through the index and use command chaining with a new search term to jump to another part of the index. He can also select quick search, which is a single-screen operation where the user has to fill in a search form. The system then carries out the necessary searches and Boolean combinations to complete the search.

2. Online cataloging and abstracts

Cataloging is chosen from the main function screen. There are three sorts of data entered and stored in the catalog record: codes, authority, and free text. Records are entered and changed online. Abstracts in different languages can also be entered, updated and searched online. The cataloging can be done either from scratch if there is no existing record in the system, or by copying a record already in the system. This record can be found either in the DOBIS catalog or in the DOBIS bibliographic pool. The system allows for downloading from other systems to the bibliograhic pool. If the cataloging is done from scratch, frequent entries for names, publisher or subject headings can be selected from the authority files. This saves a lot of work and also makes sure that the same name is not used several times in the system with a different spelling or form of a name. If an entry needs to be changed in the system it can be changed all at the same time. If a MeSH heading needs to be changed it is done only once for all the entries attached to that heading.

3. Online circulation

The status of the loan is displayed when the bibliographic index and the borrower name or number are searched. The material is charged out or checked in online. Each library sets its own loan policies, fines, overdues, hours of opening and closing dates. Holds can be placed on any or all copies of a title. Overdue notices can be generated.

4. Online acquisition

Orders are entered, and items and invoices are received online. A claim policy set for each library regulates the timing of claims for overdue orders. Acquisition status is easily accessed by vendor, library fund and bibliographic index. Prices in foreign currencies are converted to the local currency. Subscriptions and renewals are managed automatically.

5. Online periodical control

The periodical functions are selected from the main menu. It contains three major functions: the online receipt, claiming and binding of periodical issues, online entry and maintenance of full text (abstracts), and a batch program for statistical analysis of management information.

The key to the periodical function is the prediction pattern, which keeps track of the issues expected for each periodical title held in the library. A prediction pattern can only be created once a bibliographic record has been created. This is done in the cataloging function. When the issue arrives at the library, a quick title search is performed. When the display comes up, the letter y is pressed and issue has been checked in. If it does not arrive, there is a special function for treating a missing copy. Claims for missing and late issues are sent on the basis of a locally defined claiming policy.

6. Cataloging and report production

Using batch programs the system can also produce printed and COM catalogs, catalog cards and accession lists for all or part of the network in SIBDL (International Standard Bibliographic Description) format. The format and contents of notices such as overdues, orders and claims are specified independently for each library in the network.

7. Production of management statistics

Statistical information is extracted, analysed and printed in library-controlled formats.

8. Online mail

The library staff can send messages to all other users on the network who have a user ID. The user can send messages to the library staff, e.g. requests for photocopies from the library.

Security

The system has built in security. Library staff must give their correct name and password to logon. Multiple-user authorisation levels control access to sub-functions. The library user can search online but cannot make any changes or see classified information.

Existing automation at Landspitalinn Medical Library

Online searching has been done at the library since 1981. Interlibrary loan through Nordic Serials Online (NORDSER) has been done since 1983. Macintosh and PC are used for searching. The library also has MEDLINE and CHINAL ON CD-ROM since the beginning of this year. Macintosh and PC have been used for many tasks at the library such as the list of periodical holdings, accession list for new books, address labels, reports and letters.

Why DOBIS/LIBIS?

It does not matter how big the library is; the same functions need to be performed in all libraries. DOBIS is a system which handles most library functions effectively.

Landspitalinn got access to this large system without great expense. The Icelandic medical libraries have a long tradition of sharing their collections. Now that we have chosen DOBIS it is easy for other libraries to access. By sharing the system with the biggest public library in Iceland we get the benefit of their knowledge of the system. We hope that a bigger library will help us to provide better service.

One of our prime reasons for choosing the system, besides the points mentioned earlier and the points made by the testing group, was the capability of the system to handle serial control. In most systems, the periodical part has been the most difficult to design and very few systems have a good periodical control. DOBIS is well ahead in that aspect. I tested the periodical part especially and once I managed to get a grip on how to set up the periodicals

prediction patterns, it all went smoothly. I also visited the IBM library in the Boehringer Laboratory in Germany, where the periodical control had been in operation for some time and it worked well there.

Other reasons were the capacity to develop and retain abstracts. None of the Icelandic medical journals are indexed anywhere. The librarians at the medical libraries in Iceland have indexed them on cards for use in the library. The Medical Society of Iceland gave me the task of indexing the Icelandic medical literature. The task is now partly accomplished. I used a PC to do it and that meant an enormous amount of work, so we plan to go over to using DOBIS for the indexing of Icelandic literature. Everything else is accessible in other foreign indexes. For indexing we have used MeSH terms in English. We expect to continue doing that because it is too expensive to have MeSH translated into Icelandic. However, there are still people in Iceland who don't understand English that well, so we plan to append an Icelandic abstract to each record. The abstract is searchable by text-word searching.

Another reason I would like to mention is that the system is manufactured by a strong company which is unlikely to go out of business.

Implementation of the system
The agreement between SKYRR and Landspitalinn was done at the end of December 1989. The system had been in use during the testing period in the library since 1986. During that period most of the books had been entered into the system. Records older than 1986 had been bought from an external source and loaded into DOBIS. The bibliographic data had been bought from MARCIVE in the US. The records were in LCMARC and had to be converted to DMARC. Software from IBM was used to do the conversion. It did not convert the NLM classification and also there were problems due to the Icelandic character set. We had to make corrections after the bibliographic data had been loaded. It was loaded on to the bibliographic pool. All records later than 1986 have been entered from scratch. The cataloger at our library now has a thorough knowledge of the cataloging system. After only a few hours of training, provided by the cataloger at the City Library, she was able to use the system to catalogue. It took some time until she could utilize the system fully and use command chaining. It now takes her only a few minutes to catalog an ordinary book. The two libraries sharing the system have to agree to use the same rules for cataloging. It has worked well though some classification rules have had to be changed in both libraries in order to reach a common set of rules. The libraries use different classification systems, Dewey and NLM, but that does not create problems. If both libraries own the same book the record for the book shows the two different classification numbers one after another. It does not confuse the user since the systems' number-and-letter combination look so different.

At this writing, five months prior to the conference, the circulation function is about to be implemented. The plan is to start in the beginning of May. We do not circulate our journal collection so the circulation is not unnecessarily slow. We can therefore add the library user record to the system when the user uses the system for the first time. We also use the user file to input the account number for each user, which saves the library staff the time and trouble of having to look up all these numbers manually. These account numbers have to be used all the time since the service of the library have to be charged to the user's department at the hospital. The books are also barcoded as they are loaned out. Our library does not have much experience so far with the circulation function, but it appears to be quite straightforward. The City Library has been using it for some time now and is satisfied.

The bibliographic records for the serials will be added by buying in records from external sources. The records of the serial holdings from Icelandic medical libraries are bought from NOSP and loaded onto the system. We plan to add the prediction patterns as the issues arrive

at the library starting in September. Since some journals are only put out twice a year the whole collection should be in by early March 1991.

The indexing of the Icelandic medical journals will start with the first issues for 1991. We also plan to index articles of medical interest from Icelandic newspapers. Icelandic newspapers are not indexed, but often publish good articles by Icelandic health professionals that are of interest to students and patients who use our library.

As of now the plan is to start using LIBIS in May with one terminal in the library. We are also planning to install terminals at various locations in the hospital to make it easier for users to access our collection. The system was introduced to the library users in a newsletter from the library. In April we held a Special Education Day where the hospital and the library staff gave a presentation of DOBIS/LIBIS. Most of the training in LIBIS is included in the library orientation program for new hospital staff and in courses held for medical and nursing students. LIBIS is easy to learn and the quick-search facility brings it within the reach of any user.

The training of the library staff has been on an individual basis. During the test period of DOBIS/LIBIS there was a three-day course at SKYRR taught by an instructor from the University Library in Leuven, Belgium. I visited the Leuven University Library and observed the system in use. I also spent one day at the IBM Library at Bublingen in the FRG and learned how to use the periodical function. The people who took part in the testing of the system have also travelled outside of Iceland to study the system and each one has been able to make a valuable contribution of his experiences and impressions from libraries abroad. The City Library staff has also translated most parts of the system into Icelandic. It is a joint effort and our library staff has initiated the translation of the periodicals. Our user can now use English, German and Icelandic versions.

Besides the translation only a few other changes have been made. It is better not to change our copy more than absolutely necessary as this makes it easier to incorporate the new versions of the system as they are released. Among the other changes that have been made can be mentioned the following: names in Icelandic have been adopted to the Icelandic name tradition, i.e., the given name comes first, then a middle name followed by the patronymic, e.g. Jon Gunnar Jonsson; extra formheadings have been added which appear in the short information display in brackets, e.g.: Does it hurt? (video); items such as producer, and so on, have been appended to the statement of responsibility; long titles can be moved sideways both to the left and the right; special information pertaining to the main entry has been added. This information is accessible with the letter M or D; in the acquisition, the latest order appears first instead of in alphabetic order. Besides these changes, we are also able to connect to a LBSPC system which can be used as a backup if circulation in the system is down. When the system is up again, all the information is entered back into the system by simply pressing one key. The LBSP system can also be used for downloading data, production of barcodes and booklabels.

Future plans
DOBIS/LIBIS is in its early stages at our library. We hope that other medical libraries in Iceland will join the system to make a network of medical libraries. The success of the system so far gives promise for future development. The next stage for our library is to extend our use of the system and its facilities. In the future the users of the system will be able to connect with each other in different countries in a global network. For medical libraries in Iceland this will open a new door to the world of medical books and writing.

Success Factors in transforming a traditional Medical Library into an Information Center, for the Future

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Abstract
Information technology makes it possible to access internal and external information sources from any location. Every PC is a potential gateway to the world of information. Librarians have to take part in the organizing of information as well as in the traditional role of searching and retrieving information. We must take on more of a teaching role in the searching of databases and be knowledgeable about hardware and data communication questions as well as about command language. Medical libraries can make valuable contributions to better information services for patients by making patient information databases available.

A good understanding of management techniques and an effective use of human network resources will help in ensuring an interesting future for medical libraries.

The challenge continues.
The challenge changes.

Introduction
I was asked to give the same talk to this conference as I did to the 2nd Nordic Conference for Medical Librarians here in Stockholm in 1988: "Medical Libraries and Computer Departments – Competition and Cooperation." The challenge at that time, and some years prior to that, was how to survive and succeed in the midst of Computer Departments and emerging Centers for Medical Informatics etc., filled with powerful men who thought libraries were for the lending of books and everything to do with information out of computers for them.

The librarians who did not meet the computer challenge of the eighties are perhaps no longer with us, and for those of us who survived the struggle, we are still struggling, but it has become a bit of a non-issue. At least is how I feel. The nineties are here with new and exciting challenges.

Information sources and technology: decentralized use and integration
The development towards decentralized access to information sources, and at the same time a move towards integration of information sources, I see as two aspects of the same trend.

Overall implications for librarians:
The decentralized aspect of information technology is rapidly and drastically changing our working environment. I am convinced that it is through local access to information that the much talked-of information revolution will become a reality. (N. McLean, IFLA, 1988)

1. It is necessary for librarians to *find out how our customers conduct their work,* so that we can find out how best to give our services.
2. It is necessary for librarians to *take an interest in the organization of information,* not just the retrieval of information.
3. Librarians must *participate in computer network planning,* in order to secure the necessary priority for library services.

Operational implications:

Proficiency in searching. We must take our qualifications as searchers very seriously. We will be found out or we will be admired and thanked. Don't let anybody catch us with our pants down when it comes to searching medical databases.

Educational role. We will have more of a consultative role in searching. We will not be given that role, it is ours if we are professionals. Keep track of the endless alterations and news for databases of interest to your customers. Train people in searching through courses and demonstrations.

Be computer literate. It is more important to your customers that you have knowledge in computer communication protocols rather than in cataloging rules. It is important to be able to give advice on everything to do with searching, not just on command language. Your customers are able to read.

Study your customers. What are their information seeking habits? What kind of personal literature files? How are manuscripts prepared? Personally I would conduct that kind of study "invisibly" by talking to people in the library and by visiting doctors in their laboratories on some pretext. A more systematic approach is probably called for.

The library must be a showcase. You simply must have the latest fashion in information products available for your customers to use on a regular basis or to try out. Whatever may be of interest in your institution. Use your imagination! Make it easy for your customers to order the products you promote.

Networks. It is of paramount importance that the library is connected to the hospital computer network or that the hospital network plans include the library. When deciding on buying a LAN (Local Area Network) the most important consideration is to *find a knowledgeable dealer* to do business with. Nothing is more important for success than dealing with capable people.

Our LAN had to be tailor-made for *all known data communication* modes almost, not the least of which was to communicate intelligently with Medline, etc. Plus of course being able to handle a variety of operating systems.

You must be able to link up the 9th PC without having to make an entirely new investment. And you will want the 9th and more terminal. Don't think you don't just because you have a small library!

Get access from your library-LAN to whatever *institutional resources are available,* and give access to *library resources from the departments.*

Service to "new" user groups through integration. The scientific literature is well indexed and easily accessible, relatively speaking. Scientists are used to libraries, and are generally able to obtain the literature they need.

Who in our hospitals do not receive and adequate information service? And what kind of useful literature is poorly indexed and difficult to get hold of in our hospitals?

Patient information

Norwegian health personnel are continually being criticized for not giving adequate information to their patients.

Our library will create and make available databases which can *support health personnel in their patient information work.* The databases will contain information on patient associations, audiovisual material and literature.

In the situation of discharging a patient, I would like to see health pe.... ... 'he patient information from the library database, accompanied by an invitation to use the medical library. An entire Medline search could be conducted and given to the patient should the patient or health worker find it useful.

Hopefully when patients understand that it is possible to get to the bottom of all information easily through the hospital, that will help to keep lawyers away from the hospital. The benefits to the patients themselves are more obvious. This effort will be in step with the consumer movement and a useful contribution from the library.

Material: inhouse produced publications
One very obvious task for medical librarians to do, which would also help in the patient information work, is to index all kinds of documents, videos, films, etc., produced by various hospital departments and not available in national or international databases.

Open public access catalogues
Are they accessible in a form which suits health personnel? Could we make it possible in the future to browse the contents pages of the registered books? Better subject access is certainly needed. Our cataloging rules and practices were meant to serve a different purpose than that of public access catalogues.

Management
    Human networks (your colleagues)
    Service management (your customers)
    Visions and missions (your superiors)
    Business aspects (your money)
    Marketing aspects (your success)

Human networks
The human network is a powerful tool for success. None of us exploits that valuable resource to the full. There are enormous amounts of knowledge and advice available just for the asking. Another aspect is that close cooperation among librarians through associations and groups makes us united and strong as a profession, from which we will all benefit.

    It is important that we as individual librarians build up and look after our human network, our personal consultancy. And it is important that we as a body build up and look after our professional network. The stronger we are as a group, the less we will be troubled by power-games from others.

Service management
We work in the service sector, not in production industry. Even so, whether or not we charge for services, we are selling and marketing the whole time in our contact with people, in the very way we conduct ourselves and our business. Oscar Wilde said that only superficial people don't judge by appearances. We are on a stage. We ought to pay attention to how we look and to the things we surround ourselves with. It all adds up when customers are forming an opinion about library service.

    The way we treat each other, the "atmosphere" amongst the library staff will also influence our customers. It is not enough to be nice to customers, we must be nice to each other. The vibrations will reach out to the audience so to speak.

    Internal marketing of ideas, the message, services, the image, it all has to be sold to your staff first. What you can't sell to your staff, you certainly cannot sell to your customers. The internal marketing of ideas and patterns of reactions in very important! Discuss everything, agree on a strategy in major as well as minor issues. You are "the library". Don't give any contradictory signals when dealing with your customers. Best Japanese industrial philosophy this!

Customer participation is important in all service work. Win your customers over to your team and let them be part of your resources, your workforce. The library belongs to them, and they will work to keep and improve it if you have succeeded in getting them on your side. As librarians we exist only as long as our customers find our services useful and pleasant. There are alternatives. We do have competition!

Are the conditions for our customers good enough? For every service, analyse what part we expect the customers to play. Let us think through the various routines and ask ourselves: are our forms and instructions clear enough, do the customers use an unnecessary amount of time on certain tasks, etc. Try out your own library, play the customer, or get somebody you know well to do so. Find out how it feels.

Visions and missions

Efficient service on a daily basis is necessary but not enough. *To have a vision is essential,* an overall intention, an overall plan. We must know in which direction we are going. If we know what we want, that in itself is a powerful tool in making it happen. Make life easy on your hospital president. Take control over library matters, be responsible and communicate clearly what you want.

What is true of visions, is also true of missions, as I call the different projects we work on. For some years the computerization of the library was the major mission. The computerization efforts continue, but other projects occupy our minds. Information from the library for use locally and information to patients are examples.

Don't try and do everything at once. If you aim at everything you hit nothing. And don't expect any support before you have proved yourself. Get at least a very small success story together and work from there.

Know what you want, communicate your message clearly, and you will make it happen despite all kinds of obstacles, lack of personnel, lack of funds, etc. *The main obstacle in achieving anything or in making changes is yourself.* Most restrictions you feel, even in the public health sector, are self-inflicted.

Business aspects

Money is a powerful tool for achieving your goals, for having success. A part of our library at Rikshospitalet is run like a "business". Our basic services are free for everyone connected with our hospital, but we can use the hospital facilities and our own private time for money-making activities. The only condition is that we give 10% of our gross turnover to the hospital research organization.

I recommend striving for some financial independence. It gives you flexibility to travel and find out what's going on. You can be at the right place at the right time more easily. It will give you more funds from regular sources as well. The Matthew principle applies: when you have something, you will be given more.

Marketing

The most important promotional activity in a library is simply giving good service, and our most important allies are our customers. They will work effectively for our budgets and our general success given the right conditions. *So looking on the bright side; people come to the library,* we get an opportunity every day to show what our libraries can do. It is a great advantage we have over most other departments whose work is not so visible. To be seen is a powerful tool in achieving success! We are free to arrange all kinds of promotional activities in our libraries: talks, courses, demonstrations, receptions, whatever.

Ending note
Let us have a high opinion of ourselves and our work and communicate our enthusiasm and our value to everybody we come into contact with. After all, what can be more important than organizing and retrieving information? Let's conquer the world!

The Iceberg of Crumbling Books:
Conservation and related activities in Norway

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Abstract

The paper reviews the condition of books in Scandinavian libraries in comparison to other libraries. A cold climate in the stacks has delayed the degradation of paper. Few conservators work in the Norwegian libraries, and much of the conservation effort will be concentrated in the development of a new national library as a servicepoint for other libraries. Legal deposit will according to a new act be extended to all published documents in new media as well as paper documents. Archival copies of paper documents will be stored at a low temperature preserving the documents for a prolonged period.

Promotion of permanent paper has been fairly successful in Norway. The visual symbols of the ideas behind this promotion may be copied in other countries. Copyright drawings from Norway may be used freely for the non-commercial promotion of permanent paper.

Norway has perticipated in establishing an international standard for permanent paper. The author urges all librarians to support the activities of the ISO/TC 46/SC 10 "Physical Keeping of Documents" establishing international standards within the scope of this committee.

Small libraries without conservation resources ought to improve their housekeeping routines in order to keep their collections in a better condition.

The Scandinavian libraries may in many ways seem to have been protected against the most immediate effects of the modern, self-destructive types of paper. The main reason for this is simply the Scandinavian climate. Library stacks have as a rule been cool rooms with a low humidity and without unwanted biological activity destroying our intellectual heritage. These stable conditions have delayed the destruction of books, periodicals and other records.

For a rapid degradation of paper there must be some energy and some humidity present. The destructive properties of papers are released faster when the temerature is high, and when there is enough humidity surrounding the paper. The cold climate may be severe for people, but it has been rather beneficial for our records on paper. It does not, however, mean that we can avoid the harmful effects of modern paper.

In Scandinavian libraries one will of course find some sad examples of crumblong paper, especially newsprint. But the extent of the destruction of our records can't be compared with the disaster one will already find in many libraries in warmer or tropical climates where the heat and water vapour has speeded up the internal destruction of the records on paper.

When the reports started to come from American libraries where a large portion of the holdings were too enfeebled to be issued for ordinary use, many people in Norway thought that the seemingly stable condition of books and other records indicated that the alarm signals from some Norwegian librarians were somewhat exaggerated, because it was hard to find examples of other types of paper than newsprint crumbling to dust when it was touched.

But the degradation of paper is a chemical process, and chemistry knows no boundaries. You will understand that the difference in climates was the cause when it was difficult to observe many extreme examples of paper degradation in my country. Thanks to comparative

work done by Ivar Hoel on identical editions in Nordic libraries and in The Library of Congress in Washington D.C. we have learnt that degradation of paper in our libraries will require about 30 more years before we have reached the alarming condition that is already present in The Library of Congress.

In recent years Norwegian librarians have started to realise the alarming character of the conservation needs of their collections. It is like the proverbial tip of an iceberg. Only one-seventh of the total mass can be seen above water as an indication of the impending danger. The problem is bound to become critical even in our libraries. A favourable climate has only given us a respite of a couple of decades which we may use to prepare ourselves.

Even in countries with extensive programs for conservation many, of the responsible leaders of preservation work present their efforts regretting the inadequacy of the measures compared with the rapid decay of library materials. In our country the process of increasing the funds for conservation and preservation programs have just started.

In the Norwegian libraries we have until now had only two qualified paper conservators working, and those two can not do much of the conservation effort that ought to be done. Disagreement between conservators in the museums on the approach to training has made it difficult to establish a school for conservators in Norway, but we do hope that recent initiatives will make it possible to start the training of conservators for archives and libraries in Oslo.

Since the 19th century the University Library of Oslo has been functioning as the national library of Norway. Last year the Norwegian parliament decided that a department of a separate national library should be established in the Northern part of Norway. This separate national library that we now plan the outlines of, will be based on the present knowledge of our needs for conservation as an organic principle. We do hope that the Norwegian parliament will establish the complete organisation of a new national library in 1991.

On the basis of a new act of parliament there will be legal deposit of all published documents regardless of media as well as printed material. The national library will receive films, videotapes, sound-records, broadcasting programmes, television programmes, digital documents, everything that is made available for the public or distributed in more than 200 copies in any organisation. This new responsibility for the national library will give us new resources for conservation, and we have accepted that the national library must act as a central service-point for conservation of all collections that supplement our national, cultural heritage.

From October 1989 we have established a department for microfilming and restoration of photographic material. Two new paper conservators are being trained in Denmark for preservation work in the new national library. We are also planning further departments for the conservation and preservation of all new media containing analog or digital information.

Special consideration will be given to a complete separation of archival and lending copies of material. The new media give us a lot of new problems, but paperbased documents may be easier to handle. We will store archival papercopies in a mountain hall, and by using the natural properties of the environment it will be fairly economical to provide a stable atmosphere with a low temperature at about 7 centigrades and low humidity. The mountain itself will keep that stable temperature without any further energy being used, and all we need to supplement is some energy to modify the humidity to the level we want. This kind of storage is simply a very cheap solution for keeping paperbased documents for a longer period.

We have not started any planning for massconservation. We think that a plan for massconservation will be premature in a small country. Only one process for massdeacidification is yet commercially available as an alternative to expensive, timeconsuming conservation work. Massdeacidification seems to be an alternative mainly for preventing the decomposition of

contemporary books, and there is still no process which is totally uncontroversial. Massconservation with an increase of strength in brittle paper is yet a process in research, and we think that it is worth waiting for the British process of polymer grafting being made available for the libraries.

While we wait for an adequate massconservation process such as the process being developed by the British Library to diminish the threatening iceberg of future conservation needs, the invisible basis of this iceberg is growing each year at the rate of nearly one year's acquisitions. What can we do to frustrate this growth?

It is surprising that even countries with more or less adequate programs for preservation make only irresolute efforts to avert future needs for conservation of library materials. The promotion of permanent paper ought to be an integrated part of a strategy for preserving our cultural heritage. Compared to other elements of a preservation program the efforts for increased production and use of permanent paper will be cost-effective.

The Norwegian National Office for Research and Special Libraries has run a modest program for promotion of permanent paper since 1986. The effect has been an increased public awareness of the problem of brittle paper, improvements of the printing-paper produced in Norway and more adequate information about the storage capability of imported paper. As a direct result of this program the biggest book publisher in Norway has started to use permanent paper in all their books. It is hoped that information given to book designers will result in an increased number of books produced on permanent paper.

Some elements of this Norwegian program for promotion of permanent paper may inspire other libraries to new efforts for decreasing the growth of contemporary material with a potential for future decomposition. In some countries the promotion of permanent paper has been oriented mainly towards the publishers. The practical results, however, will be small if this effort is not supplemented with a program for public awareness of the problems of brittle paper.

The modernisation of paper industry and new standards for the conservation of the environment make the paper industry an ally for the libraries. People in the paper industry have normally adequate knowledge about the properties of permanent paper, and there is a clear reorientation from the use of acid sizing towards neutral or alkaline sizing of the paper. The case for permanent paper has been one of the elements for improving the operational efficiency of Norwegian and Nordic paper plants. The Norwegian paper trade has been an invaluable partner in the work done by the Norwegian National Office.

Information can never appeal only to the human intellect. Words will not always be an adequate vehicle of an idea. Much work has therefore been applied to the development of visual symbols of permanent paper. In its program for permanent paper the National Office has used a drawing of a hedgehog. The obvious symbolism is a friendly animal which might bristle with its quills whenever it is provoked. In many countries this animal is one of the species threatened with extinction, and the concern for a threatened species will not exclude the concern for crumbling books.

The Norwegian artist *Hans Normann Dahl,* who made the charming drawing of a female hedgehog for the children's book "Sirkus Mikkelikski" by *Alf Prøysen* (Oslo, 1963), kindly consented that his copyright drawing could be used for non-commercial promotion of permanent paper and supplemented the original, smiling drawing of "Bolla Pinnsvin", the modest heroine of the story, with a hedgehog expressing a protest against acid books destroying the future of all literary being. For a literary being living within the pages of an acid book crumbling paper is of course an existential problem.

This symbol was presented at the Norwegian Book Fair in 1988. The smiling hedgehog

illustrates the positive properties of permanent paper, and the unhappy hedgehog is picketing against acid books. We used two slogans: YES TO PERMANENT PAPER! and NO TO ACID BOOKS! Handouts were a pamphlet about permanent paper, the text of the American National Standard Z39.48−1984 and a collection of paper samples from Danish, Norwegian and Swedish paper producers with a minimun pH of 7.5 and a minimum alkaline reserve equivalent to 2 % calcium carbonate, containing no mechanical or unbleached chemical pulp. Very popular for people from 3 up to 90 years was a button with the smiling hedgehog and the slogan NO TO ACID BOOKS!

The Norwegian word ''sur'' means unfriendly and surly as well as acid, and some Norwegian novelists were afraid that this was some kind of protest against their books. At the Norwegian Boook Fair in 1989 we therefore used the slogan YES TO LASTING BOOKS! (JA TIL BØKER SOM HOLDER!). We do hope that this slogan is more flattering for the fortunate authors who will see their books presented as examples of publications on permanent paper. And we have started to present on behalf of Bolla Pinnsvin a special honourary prize to people in the book trade who have done good efforts using permanent paper. The results of the Norwegian program for promoting permanent paper have been encouraging.

As a small country Norway will always try to participate in international cooperation. My office thought it was important to support the work of ISO/TC 46/SC 10 ''Physical Keeping of Documents'', and we may have been instrumental for bringing the secretariat of this committee to Denmark. Ivar Hoel will say more about the work on a new international standard for permanent paper and the scope of this committee. As the chairperson of this committee, let me only ask for support from the library community to the work this committee tries to do to develop standards that may be beneficial for physical keeping of our intellectual heritage. There is no cultural heritage for anyone without some kind of physical vehicles.

A typical art library in my country is staffed by one or sometimes two qualified librarians. It goes without saying that most of those libraries will lack the resources for an ambitious conservation plan. But most of the Norwegian art libraries have important collections that will need some conservation measures.

What can art librarians do without adequate funding and technical resources? Fortunately the answer to this depressive question is not: Nothing! On the contrary there is much to be done. It is necessary to survey the collections and evaluate them, and we are now in the fortunate position that the new national library may microfilm crumbling material before it is lost. We hope that other means of conservation may be provided in the national library as a central servicepoint.

In recent years there has been an increased awareness of what librarians may do to preserve their holdings without the service of qualified conservators. These efforts may be indicated by the words *housekeeping routines*. It may not seem to be heroic to keep the books free from dust, provide acidfree boxes or covers for important or harmed items in the collection, or see to it that the stacks have a stable atmosphere without too much heat or damp, without insects, and without too many human beings with a shortsighted perspective on the holdings. It may not be heroic at all, but these efforts may be provided by all of us, and they make a great difference for the life expectansy of our holdings.

Sometimes a small problem opens up for a big perspective. That was certainly the case with a flood in a Norwegian medical library. The pages of periodicals printed on art paper were stuck together, and the volumes should have be thrown away if there had not been a librarian who started to wonder whether some enzymes could split the new and unwanted crosslinkings of the pages. Further research by Norwegian scientists on this crude process trying to save money has led to the opening of the petrified books from Herculaneum which for centuries

have been regardes as being preserved, but totally lost with regard to their intellectual content. There is hope for petrified as well as crumbling books if we are willing to do what is possible even in small countries with modest resources.

International Standardization of Requirements to Permanent Paper
A status report, April 1990

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Abstract

Standardization of requirements to permanent paper takes place on many levels: national, European, and on the international level within ISO. Since 1987 it has been on the programme of work of ISO TC 46, where it is allocated to Subcommittee 10, "Physical keeping of documents".

Together with the ISO committee TC 6/SC2, Testing methods and quality specifications for Paper, board and pulp, a Working Group to draft a standard for permanent paper has been set up. There have been close contacts to the US group revising the ANSI standard from 1984, "Permanent paper for printed library materials", and the two standards are now being developed along the same lines.

Current work is indicating that both standards will cover uncoated and coated paper, and that they will contain requirements to strength measured by tear index, to minimum alkaline reserve, to maximum content of easily oxidizable material (especially lignin) measured by kappa number, and to maximum and minimum pH-value. It is still a matter for discussion whether the ISO standard is to include testing for retained properties after accelerated aging.

Two meanings of the word "permanence" in connection with paper are discussed, and librarians are advised to be aware of the issues involved and make themselves heard within the national ISO member bodies.

Standardization of requirements to permanent paper takes place on many levels. Since 1987, it has been on the programme of work of the Technical Committee TC 46, "Information and Documentation", of ISO, the International Standards Organisation. But the start of it was the work done in the USA, where the American National Standard "Permanent paper for printed library materials" (ANSI Z39.48-1984) was adopted in 1984, and is currently being revised. National standardization or at least some consideration of these issues is also being carried out in several other countries such as Austria, Federal Republic of Germany, Switzerland, Australia, Finland, Sweden, and the Netherlands.

In this context it is also to be mentioned that the European Standards Organisation, CEN, has created a Technical Committee for paper, board and pulp (TC 172), and has also decided to have a parallel vote on the ISO standard for permanent paper when it appears for ballot, that is to consider making the ISO standard also a European standard. CEN standards (designated EN – European Norm) have a more compulsory nature than the ISO standards inasmuch as they force the member states ot use them, and they may not have a national standard differing from the EN. In April this year CEN TC 172 decided to create an ad-hoc working group to look more closely into the question of permanent papers.

Within ISO, the permanent papers have been allocated to the Subcommittee 10 of TC 46. SC 10, named "Physical keeping of documents", has as its scope: "Standardization of requirements for documents and practices relating to documents, when the documents are to be used in libraries, archives, and documentation centres, and are to retain their character-

istics. Excluded: – photography and other media within the scope of TC 42; – micrographics and optical memories within the scope of TC 171".

Standardization of testing methods and quality requirements to paper is the responsibility of another ISO subcommittee, SC 2 of TC 6, "Paper, board and pulp". These two subcommittees in 1989 created a joint working group reporting to TC 46/SC 10: Working Group 1, "Permanence of paper for documents" to draft the standard. Convener of this Working Group, and also of the CEN ad-hoc working group just mentioned, is Dr. Per Olof Bethge, a paper scientist and paper and pulp standardization expert form the Swedish Pulp and Paper Research Institute in Stockholm. ISO/TC46/SC10/WG1, consisting of about 25 paper scientists, paper manufactures and librarians from many parts of the world has until now held two meetings, and hopefully will conclude its work when meeting in London in November. After that, the normal ISO procedures of balloting will start. This, briefly described, is the framework for the international standardization of requirements to permanent paper. What, then, can be said about the contents of this emerging standard?

There are two different ways of describing requirements to a material that is to be of long use. The first is to specify in detail the component parts of the material. Such a specification has to be founded on a long experience of what is good and what is not good. With respect to paper, this method would mean producing a recipe for the permanent paper production, for instance specifying that only rag fibres were allowed. The resulting formula may be a description of a paper of excellent quality, but the drawback is that is does not allow for new methods, new technologies, new experiences. Also, it is necessary that a standard for permanent paper specifies a paper that is commercially attractive to produce. Otherwise, the standard will have no effect other than to make some frustrated librarians believe that paper manufacturers form part of a wicked world. A permanent paper standard specifying rag paper – its excellent qualities untold – as the only permanent type of paper would have such an effect.

The second way is to specify measurable properties of the produced paper. On the face of it, this ought to be easy, as there exist more than hundred standardized paper tests. But the difficulty lies in choosing the tests that have any bearing on the permanence of the paper. For instance, a recent Swedish study has shown that the important property of tensile strength shows almost no decline after 80 years of natural aging. Tensile strength or properties directly related to tensile strength should thus not be used. It is impossible to test the permanence of paper by subjecting it to a full scale test, as the time scale would have to be hundreds of years. In practice, then, one has to rely on accelerated aging test, on observations made on historical documents, and on today's knowledge about factors in terms of paper properties and paper composition that promote a high degree of permanence.

The ANSI standard of 1984, and the present ISO work as well as the various national endeavours follow this second way. But there are some great differences of opinion as to the choice of factors to include in the specifications. Some are leaning rather heavily on the formula way of thinking, some want to specify forbidden components combined with a list of measurable properties, others again want only to measure properties after accelerated aging and say nothing about wanted or unwanted component parts. This last possibility I will come back to later on; it has not been the one chosen neither in the United States for the revised ANSI standard nor within ISO. Luckily, it can today be said that the international and the US work has been done on lines that are very clearly converging. The ANSI Revised Draft Standard of March 1990, and the ISO TC 46/SC 10/WG 1 Second Working Draft of October 1989 are modeled in the same way and listing almost the same set of measurable properties. Much of the remaining discussion will be of where to set the limiting values. It is too early to announce definite details, as nothing can be definite as yet, but as far as can be judged from

discussions that have taken place in April 1990, they both will address coated and uncoated paper and will probably include: ·

- **A minimum strength of the paper, measured by the tear resistance or tear index or a combination of both.**

The tear resistance/tear index is thought to be the most important strength measure in regard to permanency, if a single of the many possible strength measures are to be chosen. It is correlated more to fibre strength than to inter-fibre strength, and this is important as the most serious degradation mechanisms, notably acidic hydrolysis, attacks the cellulose and thus the fibre strength. The tear resistance measures the force necessary to tear the paper; the tear index takes into account that thicker and heavier paper also must be stronger than thinner papers. Viewpoints of librarians on whether this ought to be the case are welcome. The folding endurance test, much used during many decades, will not be part of neither the ISO nor ANSI standard, its reproducibility being very low.

It is still open to discussion whether the ISO standard shall include retention of tear resistance/index after a accelerated aging, and, if that is to be the case, how hot and humid the climate is to be and for how long time the paper shall be exposed to it. The ANSI standard will not include it. Acceleratad aging is an important testing method in many connections, but it may be impractical to include it in a standard, especially if it turns out that it does nothing but to confirm a quality of permanence that also can be determined by other and less time-consuming tests. A parallel testing procedure of about 20 different papers, performed in paper laboratories in eight different countries that is scheduled to take place the next couple of months will hopefully provide an answer.

A minimum level of tear resistance was included in the 1984 ANSI standard, based on what US paper manufacturers could provide. Whether this level ought to be altered (and that means lowered somewhat) in an International Standard remains to be decided. The US level may not be well suited to cover the papers that exist on the world market, perhaps being produced by processes that do not necessarily give a high initial strength. If the level is lowered, it will not be very detrimental to the permanence of the paper.

In this connection, it should be made clear that the standard in question does not specify the very durable papers that may be required for special purposes where high resistance to mechanical wear is important. Standardization of such "archival paper" should be the subject of another standard, and "permanence" one of the qualities needed in these archival papers. Denmark has proposed that work be started within ISO on such a standard.

- **Minimum content of substances (such as calcium carbonate) that prevent acid attack, measured by the alkaline reserve.**

This has for a long time been recognized as important, and should present no special difficulties. A minimum reserve equal to 2% of calcium carbonate will probably be upheld.

- **Maximum content of easily oxidized material, measured by the kappa number.**

The intention of such a requirement is to prevent the presence of lignin in the paper. In the ANSI 1984 standard is was required that there should be no groundwood or unbleached pulp present, in other words that the pa$_i$?r should be "wood-free". There was no method given for testing whether this was the case or not. It is for instance known that European papers that are designated wood free may contain as much as 10% of wood fibres. On the other hand, it is good to have a maximum value, as a minimal content of such fibres is practically unavoidable and will not make serious damage. In pulp testing it is common to measure the kappa number, a way of detecting the amount of oxidizable matter present, of which lignin

is the most common. It has now been shown that measurement of kappa number can be performed also on papers, and is a possible way of detecting the amount of lignin. This may turn out to be an important improvement of the standards. The alternative will be the use of traditional microscopic fibre furnish analysis.

● **Maximum and minimum pH-value of a water extract prepared from the paper.**
A minimum pH-value is an old requirement. In the future it is to be expected that both maximum and minimum values are given. The range is not definitely decided, but 7.0 and 10.5 measured by the cold extraction method will certainly be the most extreme values that can be accepted. (For coated papers, special methods of determining the value must be prescribed).

Papers complying with the old or revised ANSI standard may be marked with the well-known symbol of compliance: the mathematical sign of infinity placed within a circle. If a future ISO standard and the revised ANSI standard are not too different, as it now may be hoped for, the possibility exists that the symbol of compliance may be universally accepted and used. If that happens, it will be a major breakthrough in the promotion of permanent paper.

A probable prerequisite for this will be that an ISO standard does not include testing for the retention of properties after accelerated aging. At the same time, there has been considerable work done in the Federal Republic of Germany to establish both as a national standard and as a European standard a classification of paper into "life-span classes" or classes of permanence – and this is done by testing retention of mechanical properties after accelerated aging and by no other means. If that is accepted, it opens up for the use of a large variety of lignin-containing fibres in papers that according to a standard are classified as permanent! New lignin-containing fibres such as BCTMP (bleached chemo-thermo-mechanical pulp) may well turn out to be better than other mechanical pulps known, but many paper experts find it too early to accept them in permanent papers since they are so new and their properties not fully known.

In order to understand the discussion at hand, it is necessary to recognize that here two different ideas of what *permanence* means are being used. The ANSI and ISO work rely on a definition that goes back to W. J. Barrow's distinction between permanence and durability: "permanence is the ability of a paper to last at least several hundred years without significant deterioration under normal use and storage conditions in libraries and archives" (definition in the ANSI Draft Revised Standard). Following this view, permanence is a property which a paper either has or has not, and the standard is used to distinguish between the two types. Following the proposal promoted by the FRG paper standardization committee, the point of departure is that no paper is completely permanent, and that the important thing is to determine to what extent a certain paper has part in the quality of permanence. The purpose of a standard in that case will only be to determine the relevant testing methods, and the concept of life-span classes or permanence classes logically follows.

From a theoretical point of view, both ways of reasoning can be well argued. For libraries and archives, however, the possibility of a rapidly deteriorating paper being officially designed as belonging for instance to "Permanence class 6.40 according to the International Standard" is very unwanted. Such a designation is extremely misleading and should be avoided.

It has been argued that unless this life-span class thinking is used to introduce classes of quality of paper, a major part of the future paper produced will not be acceptable by librar-

ians. This probably rests on a misunderstanding of what the intention is of a standard for permanent paper. It is not to make most of the paper produced permanent according to a strict understanding of that word. There is no need for a major part of the paper to be classified as such. For instance, a lot of paper made for photocopying machines had better not be permanent. The intention of a standard for permanent paper is to make it possible for people buying or using paper to be certain that for documents that deserve a long life, the paper will live up to that. For instance, when a library wants to make a photocopy of a seriously degraded document, it should be able to buy permanent photocopying paper for that purpose.

This must not be taken to mean that librarians are against any kind of quality classification. The cause of the concern and controversy has been that the adjective "permanent" has been linked to papers that are definitely not so, thus disregarding the experiences of crumbling books that librarians and archivists during the last many decades have had, and also because permanence is linked to one type of permanence only: that of retaining the mechanical properties.

Paper can be tested for mechanical (physical), chemical, and optical properties. Permanence must mean the maximum retaining of all these properties. The proposal in the Federal Republic of Germany considers only mechanical permanence. If one were to follow that line of thinking, it is probable that librarians and archivists would demand that good optical properties also had to be retained. Papers going very yellow, or even brown, as lignin containing papers do, are for that very reason not permanent. Also, testing in a contaminated atmosphere ought to be included.

Other properties than the ones discussed here may also be included in an International Standard. Two that have been mentioned are optical (fluorescent) whitening agents and fungicidal agents. They are not probable for inclusion in a permanent paper standard. There is, however, the possibility of establishing a special standard for example for artist's papers, if that is needed. In such a standard these requirements, and also restrictions on the use of fillers could be important. Such papers would also have to classify as permanent papers. Furthermore, although the permanent paper standard is to be developed for paper for documents only, it can be foreseen that it will be used by many libraries and archives when choosing paper for wrappers, folders, envelopes etc.

The decision of whether to adopt an International Standard for permanent paper or not will follow the normal ISO procedures, and the national member bodies will give their votes when the ballot takes place. Librarians are not given any special saying in this matter. They have to make their voices heard in the national member bodies. If you believe these issues to be important, you should therefore act accordingly. At present the member countries of ISO TC 46/SC 10 are the following: Australia, Denmark, Finland, France, F.R. Germany, Italy, Japan, Norway, Poland, South Africa, Sweden, USA, and USSR are participating members. Bulgaria, Canada, China, DDR, Iceland, Republic of Korea, Thailand, and UK are observing members.

The Restoration of Posters from 1940–1945 in the Royal Library

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Abstract

In 1983 the Royal Library in The Hague in The Netherlands took over a huge collection of posters from the RIOD (Dutch Institute for War Documentation).

An important part of this collection had been reinforced with tape. Through the years this tape had disintegrated and thus jeopardized the quality of the paper.

The restoration department of the Royal Library was able to treat the taped posters when the right method had been found to tacle the problems. This paper is about the different phases of the restoration process.

In 1983 the Royal Library (KB) received a request from the Dutch Institute for War Documentation (RIOD) to consider taking over a collection of posters which could no longer be adequately preserved by the RIOD due to lack of finance, space and manpower.

After careful consideration the KB decided to grant this request, since the collection was truly unique and of major (inter)national importance. The collection contained some 5,000 items and was handed over to the KB in 1985. Some 800 duplicates remained with the RIOD as an open study collection while the KB collection is primarily intended to be stored and preserved.

Origin and nature of the collection

After World War II an appeal was made to the Dutch people to part with all the relevant documentary material they had collected during the war, for the benefit of a special study centre shortly to be founded. This appeal was made by the RIOD (founded in 1945, as an aid to the historiography of the Second World War) and met with success. Among the material sent to the institute was a number of posters. Most of these had been kept by people,without ever having been used, and they were therefore, on the whole, in perfect condition. Others had been taken down from walls and fences, and although this gave them an added historical value, it had a bad effect on their physical condition.

On principle the RIOD did not purchase objects, but used duplicates as exchange copies. This resulted in a fairly complete collection. Although the collecting policy was aimed at material from the Netherlands during the war, a number of interesting foreign posters, including items from Russia and the Spanish Civil War, reached the institute along with the target collection.

Roughly speaking the collection can be divided into three categories. There are, first of all, the announcements made by the authorities, e.g. the draft for military service after general mobilization had been proclaimed, capitulation announcements, and subsequently the bilingual ''Proclamations'' of the occupiers, in Dutch and German. A second category is formed by the informatory posters, intended e.g. to advise the people about certain eating habits in time of food shortage. The third category consists of propaganda- and canvassingmaterial. Advertising material, in a sense, but aiming at "idealistic" objectives. When looking at this

category one experiences the most shocking confrontation: the superiority of National Social-ism to capitalistic America and Bolshivist Russia is indicated in catching slogans and pictures, and, not surprisingly, the Nazi ideas about the absolute inferiority and wickedness of the Jews is illustrated by horrifying samples of propaganda.

There is a great difference in the design quality of the posters. Besides very professional samples in multi-colour printing one finds extremely amateuristic attempts, some even drawn by hand in editions limited to one or only a few. The quality of the paper varies greatly as well. As the war went on, material became increasingly scarce and paper deteriorated accord-ingly. Some posters were printed on both sides, or slightly altered so that they could be used again.

Use of the collection

The collection could be visited in the "poster-attic", where they were hanging on racks, attached to cardboard strips fastened by a sort of masking tape. After consulting the registra-tion cards, containing an exact description of the posters with their thematic classification, visitors could search the racks for the relevant objects under the supervision of a RIOD staff member. Using masking tape had been advised in the early sixties, after scientific testing and subsequent approval. As the collection was regularly consulted and often used to provide illustrations in publications about the war, it was decided to reinforce the backs of the posters along the edges and the folds by using masking tape as well.

Unfortunately the adhesive components in the tape began to "sweat" and migrate to the front of the posters after some years. This phenomenon is also known from cellotape – often used for domestic purposes – which eventually gives way completely, leaving a shiny, brown trail of desiccated, hardened glue. The masking tape did not give way, but the adhesive wormed its way through the posters, with disastrous results. A lattice of brown marks appeared on the front of all the posters on which the tape had been used. The collection of duplicates, generally stored in portfolios, ironically, got off scot-free.

As indicated above, the KB was approached for the restoration of the posters. This was by no means a coincidence. Since the KB has moved to the new building estate near The Hague Central Station in 1982, it can boast a modern, well-equipped building, where climatic condi-tions can be accurately controlled, which is absolutely imperative for sound, professional conservation of sensitive materials like leather, wood and paper. Moreover it houses a large restoration department with the knowledge, skill and technical facilities for the effective application of diverse restoration methods.

Treating the Posters

After its arrival, the collection was first divided into very urgent cases (the so-called tape-posters) and those whose restoration could be temporarily postponed. The description below may provide an insight into the working methods followed at the KB.

Treatment is always phased. After a photograph has been made of the poster, it first of all undergoes "dry treatment": surface dirt, etc, is removed with powdered eraser. Next the tape is taken off, which is fairly easy after it has been heated by a hair-drier. The remaining adhes-ive is dissolved with white spirit and scratched off. Adhesive residues are dissolved as much as possible in an odourless kerosene bath. These treatments are applied in a special cabinet with permanent extraction, because white spirit and kerosene are both inflammable and a health hazard.

A kerosene bath is not immediately associated with "dry treatment", but is nevertheless considered "dry", because this liquid does not swell paper fibres. After the kerosene bath the posters are left to evaporate for 24 hours in a fume hood. This is followed by the "wet

treatment", for most posters also suffer from paper acidification. Paper is subject to acidification through a complex of factors, the most important being the composition of the paper itself and external factors like humidity, temperature and air pollution. The result is a gradual decay of its structure, which may eventually lead to zero flexibility: the paper simply crumbles on being handled. Ground-wood paper, on the market since 1840 due to shortage of raw materials, will certainly disintegrate if it has had an alum-rosin size treatment to allow better writing or printing. Paper made from good raw materials, like rags, also become acid, but the results are less dramatic.

During the war the correct raw materials were more and more difficult to obtain. All sorts of materials were used for papermaking. Consequently quite a number of posters suffer from acidification. As long as the "inner" structure of the paper is still sound, it may be saved by deacidification. The acidification process is stopped by treating the paper with an alkaline salt, which neutralizes and deactivates the acids. Moreover, by giving a sort of overdose, a buffer is added to prevent future acidification. All posters are deacidified by means of magnesium carbonate. This salt becomes magnesium bicarbonate by conducting carbonic dioxide through a high-pressure cylinder filled with water. Magnesium bicarbonate is easily soluble and is sprayed onto the posters. After evaporation of the carbonic acid the magnesium carbonate remains in the paper. For maximum result he paper should first be rinsed in water of c. 40° Celsius for half an hour. This soaks off remaining dirt and broken-off cellulose fibres, because the network of fibres will swell. This swelling also enables the magnesium carbonate to penetrate deeper into the paper. This method can, of course, not be applied to posters with water-sensitive inks or colours. In such cases deacidification takes place on a suction table, where a solution of alcohol and magnesium carbonate dissolved in water is drawn into the paper. This suction technique, combined with the fact that alcohol is safer for water-sensitive matter, will prevent ink and colours from bleeding and being washed away. Once the posters are dry again the "mechanical" damage is tackled: repairing tears and filling holes in the paper. Japanese mending paper is used, which is eminently suitable for restoration purposes because of the length of its composing fibres. Posters that are in a very bad condition are lined, i.e. a thin layer of Japanese paper is affixed to the back of the poster with watery starch. After that they are flattened, because wet treatment causes paper to cockle. The posters are slightly dampened, put between sheets of blotting paper and weighted with planks. Possible other rucks can also be removed in this way. After 24 hours they are dry and flat. The "reborn" posters are finally stored in chests of drawers. Horizontal storage is the best method for paper, but demands the greatest possible care to prevent new "mechanical" damage, if the posters are handled by researching visitors. Every poster has a conservation card on which all treatments are recorded for future reference. With the duplicate files of the RIOD documentation system in the KB and the photographs taken before treatment, these cards provide an excellent basis for research.

English translation by Lysbeth Croiset van Uchelen-Brouwer.